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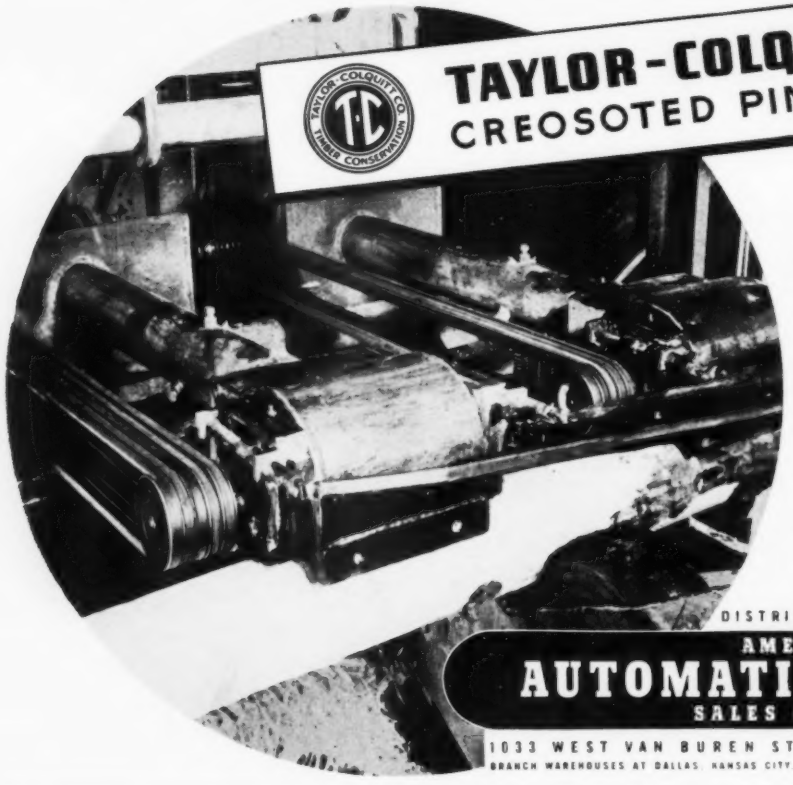

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To this strange contrivance T-C poles owe their finished look. It is one of several trimming machines built by Taylor-Colquitt Company through which poles are rotated to give them a smooth surface.

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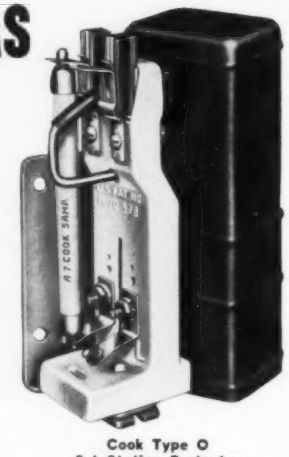

Cook Type O
Sub-Station Protector

THE universal Type O Sub-Station Protector, product of Cook Electric Company, is suitable for indoor or outdoor installation. The Type O has an indexing mounting bracket which makes it possible to install the bracket separately and allows the protector unit to be turned on the bracket for convenient wiring. It also provides Tru Gap Lightning Dischargers, fuse protection, sturdy non-corrosive cover and phosphor bronze fuse clips.

The Type O, because of its many features of convenience and its long record of satisfactory service, has been widely adopted by successful operating companies as standard equipment.

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A New Book

"Soldering for Workshop, Farm and Home"

By JOHN BONERT

This book covers soldering in general, but also includes valuable information for telephone plant men, particularly apprentices. It discusses soft soldering, fluxes, tinning, soldering coppers, wire splices, soldering on lead, closing seams in a split cable sleeve, soldering and sweating with a torch, joints, hard soldering or brazing, construction of a soldering copper holder and pad, etc.

Copies of this book should be supplied to plant departments of telephone companies, and it should be placed in all public and university libraries.

Telephone companies, by sending copies of this book to each switch line company, would help eliminate trouble and service interruptions on their lines, and at the same time promote much good will.

Order this book through TELEPHONY, *608 S. Dearborn St., Chicago, Ill., at only $1.25 per copy.*

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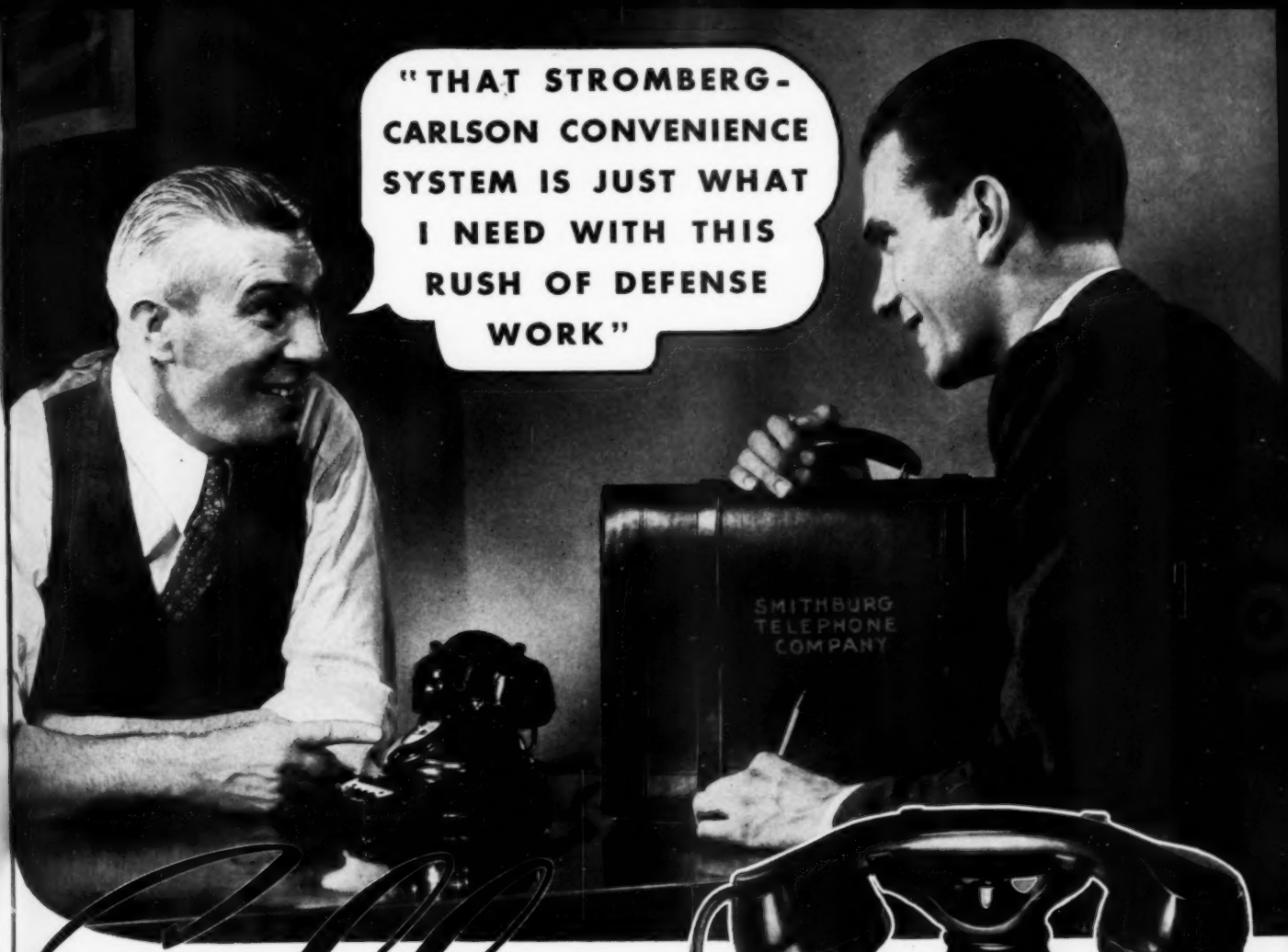
"THAT STROMBERG-CARLSON CONVENIENCE SYSTEM IS JUST WHAT I NEED WITH THIS RUSH OF DEFENSE WORK"
SMITHBURG TELEPHONE COMPANY

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STROMBERG-CARLSON CONVENIENCE SYSTEMS TO SMALL SHOPS EXPANDING FOR DEFENSE WORK.

Under the rush of defense work, small shops are growing. Many of them have grown to a point where they are too big for one or two central trunks and a few extensions. They need intercommunication facilities, yet they are not big enough for a P.B.X. board and an operator.

Stromberg-Carlson Convenience Systems offer the answer to the problem. They permit instantaneous trunking from any station, intercommunication without the aid of an operator, 24-hour service, ability to talk long distance from any station, and freedom from trouble because of their simple, durable construction.

Two types of station instruments are illustrated which are used with Stromberg-Carlson Convenience Systems — No. 1215 Type (12-button), and No. 1195 Type (8-button).

Stromberg-Carlson Convenience Systems can be furnished with 1, 2, or 3 central office trunks and as many intercommunicating stations as there are further available buttons on the telephone selected.

ST Systems have selective talking and selective ringing with secret service on all connections. Other systems have selective ringing and common talking for intercommunication, with secret service on trunk connections.

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2. SMALL, COMPACT SIZE.
3. DESK SET PORTABILITY — EASY TO PICK UP WITH ONE HAND.
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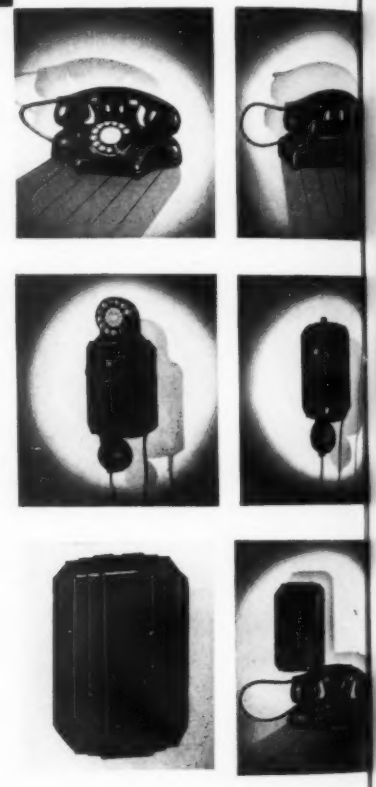
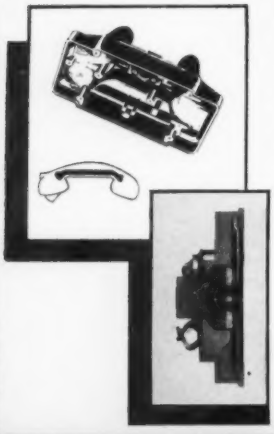
12. LONG RESILIENT CONTACT SPRINGS — POSITIVE ACTION AND EASILY ADJUSTABLE.
13. EASY MAINTENANCE—NO SPECIAL TOOLS REQUIRED.
14. SMALLER, MORE EFFICIENT RINGERS.
15. SMALLER, EFFICIENT CONDENSERS—AND INDUCTOR COILS.
16. RESONANCE CHAMBER AND NEW TYPE GONGS—GREATER CONCENTRATION AND PENETRATION OF RINGING TONE.
17. *TRIAD* CIRCUIT WHICH ELIMINATES SIDE TONE AND DISTORTION WITHOUT SACRIFICING VOLUME.



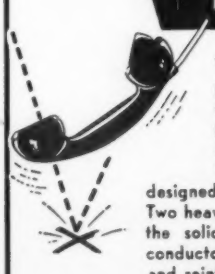


BATTLESHIP CONSTRUCTION. Kellogg Masterphones are ruggedly constructed throughout and reinforced at all points of strain. They can stand abuse! Molded Bakelite bases, housings and handpieces resist wear and breakage. Time and wear do not mar their smooth, lustrous finish.

Famous NON-POSITIONAL transmitter with patented spherical electrode construction comes in all Kellogg Masterphones without extra charge.

AN ORDINARY SCREW-DRIVER is the only tool required to remove or replace any Masterphone part. Maintenance, installation, inspection—all are but a matter of minutes. This saving in time and tools is another example of the many little extras which typify Kellogg products and which mean so much to you in extra value.

PROTECTED *from* BREAKAGE



You seldom hear of Mast phone breakage even thou subscribers will drop ha sets in spite of your p cautions. That is beca Masterphone handpieces designed right and built so rugge Two heavy brass bars molded throu the solid Bakelite handle, serve conductors and add extra streng and reinforcement where it is needed most. Masterphones cost less maintain.

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ASTERPHONES

YOU MORE FOR YOUR MONEY

IN FIRST COST, IN LOWER MAINTENANCE AND IN LONG ECONOMICAL SERVICE LIFE!

Most telephones offer no more than the mere ability to transmit and receive conversations. But Kellogg Masterphones go further than that! They have a long life which maintains your investment on a sound income-producing basis. They employ standard interchangeable parts in both Wall and Desk types which eliminate excessive inventories of parts. They are flexible in meeting various applications and parts can be added or subtracted to fit any specific requirement. They are the simplest and easiest instruments to maintain, and these illustrations show why you seldom ever hear of Masterphone breakage.

In addition to giving you everything you want from a sound operating and investment standpoint, Kellogg Masterphones have the distinction of winning subscriber approval on the basis of pleasing practical design.

KELLOGG SWITCHBOARD & SUPPLY CO., CHICAGO

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EXTRA EDITION

Telephon

An Advertisement of Leading Supply Manufacturers Whose Prod... Distrib...

KELLOGG RECOMMENDS TH...

HEMINGRAY INSULATORS HAVE LONG LIFE—SAVE ON OPERATING BUDGETS

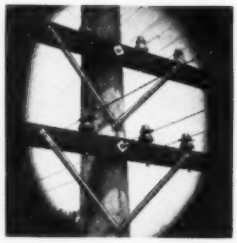
When a glass insulator can be had that outlasts the pole it's used on, telephone men establish that insulator as their standard. So Hemingray, through carefully controlled production which assures this extra long life, has earned its "first place" position. Made by Owens-Illinois Glass Co., these Hemingray Insulators are impervious to moisture — do not age or deteriorate — have high mechanical and sustained dielectric strength. They are unaffected by sudden temperature changes, and are available in all styles. Specify Hemingray Insulators and cut your operating budget.

ODD.....BUT TRUE!

5 DAYS AT 2400° F. TEMPERATURE ARE REQUIRED TO FIRE PORCELAIN INSULATORS FOR TELEPHONE WORK···ORDINARY METALS TURN TO LIQUID AT 1800°!
THE SULPHUR FUMES IN COAL MINES ATTACK COPPER AND BRONZE CONDUCTORS, BUT HAVE NO EFFECT ON IRONITE DROP WIRE!
FOR THIS REASON MORE IRONITE DROP WIRE IS USED FOR COAL MINE TELEPHONE LINES THAN ALL OTHERS COMBINED!
THE FLASHLIGHT GOT ITS NAME BECAUSE THE VERY FIRST ONES WOULD PRODUCE ONLY A SINGLE FLASH OF LIGHT AT A TIME. (THIS IS ONE OF SEVERAL VERSIONS)

Indiana Crapo, High Strength Line Wires Lower Line Costs

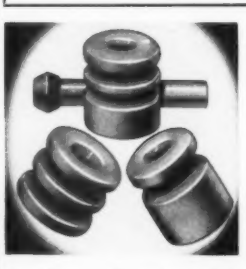
The new high-strength line wires made by the Indiana Steel and Wire Company cut costs in line construction because of the longer spans which they make possible. Crapo HTL-85, High-Tensile, Low-Resistance Line Wire permits 225 foot spans in heavy loading districts. Crapo HTL-135, of still greater tensile strength, permits spans to 350 feet in heavy loading areas. These new line wires cut costs of new construction and provide stronger spans with less maintenance on existing lines. They reduce the number of poles required and make line extensions more economical and profitable.



Complete Stocks of Joselyn Pole Line Hardware Carried at Warehouses Throughout the Country

Weather conditions and Father Time hold little terror for pole lines equipped with Joslyn hardware. For there is an extra amount of strength and ruggedness built into this material. A pure zinc coating gives lasting protection from rust and corrosion. Long experience in manufacturing telephone needs assures you that Joslyn equipment is properly designed for the best construction job. Complete stocks are carried at warehouses throughout the country. This means faster, more efficient service at anytime, anywhere.

Porcelain Products Knobs & Tubes Provide Maximum Protection



Good telephone installations call for the use of Porcelain Products' Knobs and Tubes . . . for these insulators are the finest and best that money can buy. Constant laboratory checks, inspection during every step of their manufacture, assures you of highest quality knobs and tubes, all of the same size that will save your installer's time and your money. They are packed in various sizes to fit the requirements of all types of installations. If you're not already using Procelain Products, try some the next time you order. Ask other telephone men what they think about them.

...ne Facts

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...se Prod... Distributed by the Kellogg Switchboard and Supply Company

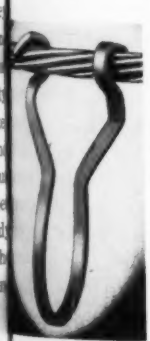
...S THESE BETTER PRODUCTS

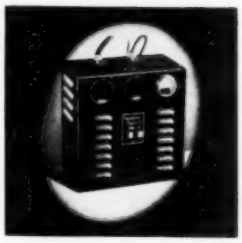
...ternal Protective Coating ...educes Shelf Deterioration ...f Ray-O-Vac Phone Batteries

...Season after sea-...n, month after ...nth, long after the ...e you expect or-...inary telephone bat-...ries to signal feebly ...r replacement, Ray-...Vacs carry on, full-...wered and hearty. ...ey cost no more ... but how they cut ...wn replacement ...sts! An internal protective coating ...hich reduces shelf deterioration, makes ...ese batteries especially serviceable in ...lephone work. More and more telephone ...mpanies are finding out that they can ...ve money by standardizing on these effi-...nt dry cells. Specify Ray-O-Vacs on ...ur next order.

...ATIONAL CABLE RINGS ...AVE TENSION GRIP — WILL ...OT SLIP OR JUMP OFF

...When you hang the cable with National ...gs you get surety, speed and economy. ...ey are very easy to place on the strand ...d the work of hanging is quickly done. ...ce placed, National Rings, because of ...eir tension grip, remain firmly in posi-...n and will neither jump off nor slip along the strand. This feature saves time for it eliminates entirely the necessity for re-riding the messenger strand to relace or respace rings and permits pulling in the cable from either direction. They are packed in "Handy-Five" clusters for convenience in handling.





Charge Follows Load with Fansteel Taper Rectifiers

These dependable rectifiers provide automatic charge regulation for PBX, toll and small central office batteries at the lowest possible cost. Operation is extremely simple. After the charging rate is set to meet the average normal load requirements, the charge rises and falls in proportion to the load demand and variations in battery voltage. The charge automatically follows the load, rising with increased traffic and tapering off during light load periods. No overcharging, no undercharging. Write for Bulletin TC-51.

Chance Anchors Are Available for Every Type of Installation

The fact that the A. B. Chance Company holds its position as the world's largest anchor manufacturer is partly due to the versatility of its engineers in developing anchors to meet every anchoring requirement. Shown here is the Chance Steel Expanding anchor, made in 2- and 4-way in many sizes. Strong, easy to install. The Wej-Lock Expanding malleable anchor, the Maleable Never Creep, Chance Wrench type and No-Wrench Screw anchors. Chance Cone anchors and Chance Rock anchors make the line complete.

Quality Materials Assured By Careful Pre-Selection of Line Materials

When a telephone man buys line supplies there is one thing that is uppermost in his mind. That is *quality*. Experience has proved that inferior materials increase, rather than decrease the cost of line construction.

For this reason Kellogg protects its customers by carefully and rigidly selecting and testing the materials that they recommend. In many cases the Kellogg research laboratory works hand in hand with the development laboratory of the manufacturer to perfect or improve an item before it is ready for general use.

The Kellogg catalog contains the products of all the well-known manufacturers of line supplies and construction materials, including such companies as the Joslyn Supply and Mfg. Co., Owens-Illinois (Hemingray) Glass Co., Porcelain Prdts. Co., A. B. Chance Co., National Carbon Co., Kester Solder Co., Indiana Steel and Wire Co., National Telephone Supply Co., Ray-O-Vac Co., Fansteel Metallurgical Corp., etc., etc. This is the telephone man's assurance of quality.

In addition to relying on Kellogg for the finest and longest-lasting materials, most telephone men have found that the efficient, intelligent handling of their orders by experienced folks can't be beat.

It has long been a policy at Kellogg that telephone men should pay no premium for high grade materials. That this policy is adhered to can be seen by the fact that so many telephone men continue to make Kellogg their main source of line supply items.

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"RINGING for Keeps"

NATIONAL CABLE RINGS Assure—A LONG-LASTING, LOW-COST INSTALLATION

NATIONAL RING

HANDY FIVE CLUSTER

NATIONAL EXTRA LONG RING

When you ring with "Nationals" you simplify the whole cable hanging job and reduce to a minimum, installation time and costs.

The use of National Rings makes it possible for the cable to be EASILY INSTALLED anywhere, even in obstructed or congested areas or in rough country districts where the lines do not follow the highway.

Because of the special "Tension Grip" design of "Nationals," they remain rigidly in position and will not slip along or jump off the messenger strand—this eliminates the time consuming task of "reriding" to replace or respace rings and permits the pulling of the cable from either direction.

And by the use of Extra Long Rings you can hang an extra cable on existing strand.

All National Rings are gathered in "Handy Five" Clusters that prevent the rings hooking together in the lineman's pail.

Order from your dealer today.

THE NATIONAL TELEPHONE SUPPLY CO.

5100 SUPERIOR AVE. — CLEVELAND, OHIO

Canadian Mfr.—N. Slater Co., Ltd., Hamilton, Ont.

Export Distributor—International Standard Electric Corp., New York, N. Y.

USE "NATIONALS" — THE RINGS with THE TENSION GRIP

Subscriber Satisfaction Means Profits

Get Rid of Noise!

with the

New Improved RTC-2 VINCENT

RARE GAS RELAY

- *Installed in a Minute*
- *No Moving Parts*
- *Thousands in Service*
- *Fully Guaranteed*

Eliminates unbalance noises in metallic party lines employing divided ringing to ground. Works with either harmonic or code ringing.

• • •

Write for Catalog 39-A describing

Non-Grounding Rare Gas Arresters

Terminal Strips

Potheads Housings

L. S. BRACH Mfg. Corp.

55-63 Dickerson St. Newark, N. J.

Signal Circuit Engineers Since 1906

TELEPHONY

The Journal of the Telephone Industry

December 6, 1941 — Vol. 121, No. 23

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XUM

By DANIEL SEITZ
Cable Superintendent,
York (Pa.) Telephone & Telegraph Co.

Approved Maintenance Practices

This series will now consider in detail the various methods of cable fault location. This is a most important subject and we suggest that you read carefully each installment and then file for future reference. These articles contain a wealth of information which has never before been published. While many of these methods are new, you need not doubt the results for they have all been tried and proved in actual practice. We feel sure that you will find the information furnished most useful in your daily work. RAY BLAIN, *Technical Editor.*

PART XI. This installment is the first of several on cable fault location, in a series especially written for plant men. The last article appeared in the November 22 issue.

PROPER FAULT analysis generally determines the speed and accuracy of locating cable trouble. Inaccurate fault location usually results in unnecessary sheath openings and delay in restoring service.

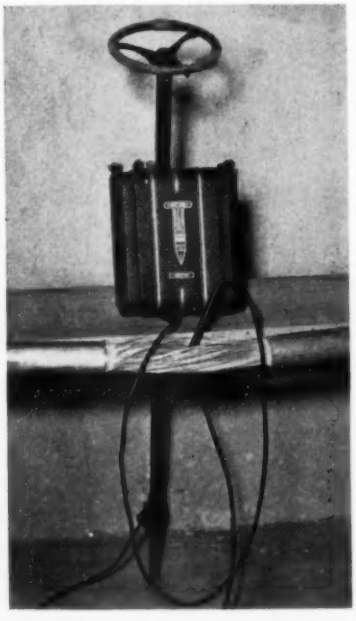

Fig. 1. Amplifier for pair identification and exploring coil mounted on rod for fault location.

Cable failures caused by moisture or accidental contact with power wires affect not only subscriber's circuits but special services, such as toll lines, battery feeds to PBX exchanges, and printer telegraph circuits. The present-day urgent need for these special services makes it extremely necessary that all cable faults be located and cleared with the least possible delay.

Properly - trained personnel and adequate equipment are both essential to insure accuracy and speed in cable testing. The larger telephone companies all have the necessary facilities, but many of the smaller companies must depend upon their cable trouble-shooters to analyze the fault, locate and clear the trouble.

Some trouble-shooters are familiar with the use of testing instruments, while many have never had the opportunity to learn the use of a Wheatstone bridge and other necessary equipment. We shall attempt to make some practical suggestions for the location of cable faults in the hope that they will be of especial benefit to them in their daily work.

Men now engaged in cable work, who are not familiar with the Wheatstone bridge, should be given the opportunity of learning its operation without delay. An understanding of the fundamental principles of a bridge is not extremely important if a man is able to correctly interpret the readings when testing to locate cable faults. Preliminary tests to determine the nature of a cable fault in the larger exchanges are made from the central office test desks, which are equipped with the necessary voltmeters, test battery and switching keys.

DANIEL SEITZ

When permanent testing facilities are not available, a volt ohmmeter, of the type described in this series for use in connection with the location of trouble on buried wire, will also be found satisfactory for making tests of cable faults either from the central office or in the field. This instrument, if used as a voltmeter, may also be used to test pairs for shorts, crosses and grounds. The approximate resistance of the faults may be determined by applying the instrument as an ohmmeter.

A tone for identifying cable pairs will be required in connection with all cable fault location. The conventional tone or bug, with which prac-

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Fig. 3-A. Measuring loop resistance.

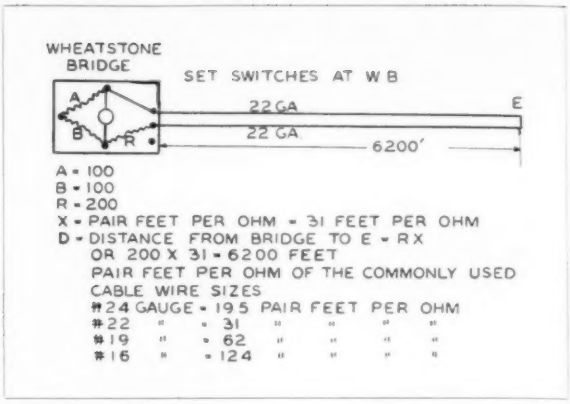
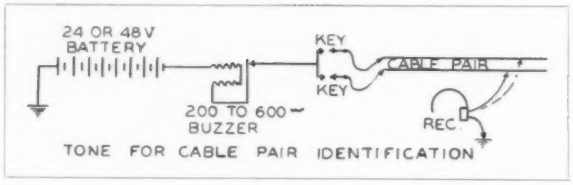

WHEATSTONE BRIDGE
SET SWITCHES AT W B
A
B
R
E
22 GA
22 GA
6200'
A = 100
B = 100
R = 200
X = PAIR FEET PER OHM = 31 FEET PER OHM
D = DISTANCE FROM BRIDGE TO E = RX
OR 200 X 31 = 6200 FEET
PAIR FEET PER OHM OF THE COMMONLY USED
CABLE WIRE SIZES
#24 GAUGE = 195 PAIR FEET PER OHM
#22 " = 31 " " " " "
#19 " = 62 " " " " "
#16 " = 124 " " " " "

Fig. 2. Test desk.



tically all telephone men are familiar and which may be fabricated locally by connecting a buzzer, batteries and condenser, will ordinarily prove adequate. In order to identify a cable pair or pairs considerably distant from the point where the tone is connected, one side of a head receiver is usually connected to the ground and the other side to the cable pairs by cutting or puncturing the insulation. This practice is often the cause of trouble in splices especially when the insulation has been boiled in paraffin.

Injury to the insulation may be entirely avoided and much time saved by using an amplifier of the type indicated in Fig. 1 to identify pairs to which tone is connected. This instrument makes use of a blunt metallic tip as a probe which is connected to the set with a suitable cord. When this probe is held close to the pair carrying the tone, it may be heard clearly without the necessity of puncturing the insulation. The output volume of the tone may be reduced when the amplifier unit is used as a pickup device. This reduction in volume will eliminate objectionable inductive interference with circuits adjacent to those carrying the tone, such as special repeater toll circuits.

The amplifier unit is equipped with self-contained batteries and a loudspeaker which eliminates the need of a bothersome head-band receiver. Considerably less time is required by the use of this method of cable pair identification which also helps reduce the length of time service is interrupted on important and busy lines.

Another tone or bug which may be used to advantage for identifying cable pairs is shown in *Fig. 2*. This set will be found especially useful where induction from the conventional tone proves objectionable. The buzzer used in this circuit may be of any resistance from 200 to 600 ohms. The set will operate only when connected to a clear pair and with a receiver bridged from the pair to the ground.

With this arrangement, the interference caused on adjacent circuits will be of short duration after the pair has been identified at a splice or terminal. The tester or cable splicer's helper may be signaled to come in on a talking pair by tapping a prearranged code. The key on the test board should be arranged so that the tone may be connected to either or both sides of the cable pair.

It is generally agreed that the most difficult cable trouble to locate is that caused by moisture, because such faults are usually of extremely high resistance. The resistance of a fault will often indicate the best method to be used in making the location tests. The attempted use of a tone generator and exploring coil, to locate a point along a cable where a reduction in the tone volume may be detected on a high resistance fault, often results only in wasted time. Even reasonably low resistance moisture trouble should be checked for resistance after the tone generator has been connected to the pairs and permitted to run for a few minutes.

A sharp increase in resistance indicates that the current from the tone is drying out the moisture and that some other method should be used. The connection of battery to the pairs with the tone generator frequently keeps the resistance of the fault low enough to permit a location. However, in many cases, this method only increases the drying effect and defeats the intended purpose.

Wheatstone bridges, especially the portable type, should be periodically checked for accuracy because any slight fault in the instrument will cause serious errors in locations. The sensitivity of the galvanometer is extremely important when making locations of high resistance faults. Many of the older types of bridges are not equipped with galvanometers of sufficient sensitivity for accurate testing. Attempted local repairs by a jeweler not familiar with testing instruments may reduce both the sensitivity and accuracy of a bridge.

The bridge should also be equipped with a galvanometer shunt to protect it against injury from excessive current. In making the preliminary balance, the shunt should be set first at .001, then changed to .01 and finally to open. With the shunt set at the open position, the maximum sensitivity of the galvanometer is obtained. The recommended battery voltage of the manufacturer for operating the bridge should be carefully maintained.

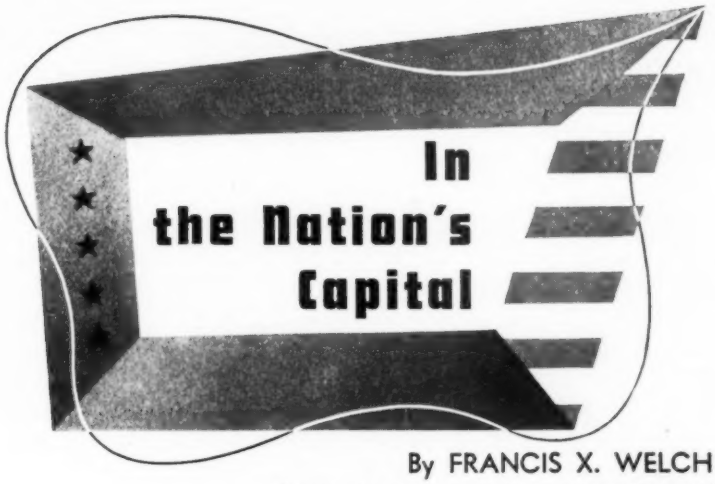
Higher voltage may be applied in cases where the resistance of the fault is extremely high and a reading is difficult to obtain. The use of high voltages should, however, never be attempted except by those familiar and competent to operate the bridge under such conditions.

Various bridge methods of testing as used on telephone work are explained briefly as follows:

The Varley loop method proves satisfactory for locating practically all telephone cable faults and should be used by all beginners with the Wheatstone bridge. When this method has been mastered, one may then begin the study of more complicated loop methods and their variations.

The Wheatstone bridge connected for measuring the loop resistance of a 22-gauge cable pair, to determine the length of the loop in feet, is shown in *Fig. 3-A*. To insure accuracy, always make sure that the

(Please turn to page 28)



By FRANCIS X. WELCH
Washington Correspondent for TELEPHONY

"Stay in middle" seems to be safest course to follow in tumultuous Washington these days . . . Industry is confronted with serious problem of priorities, price control, labor policies, etc. . . . Situation of electric utilities operating own plants discussed . . . Radio celebrates 15th anniversary—which again brings up the regulation angle. OPM set-up for handling telephone matters.

RIP VAN WINKLE or Don Quixote? That is the choice which confronts many industries today, in coordinating their relations with the government in Washington. As usual, the safest course appears to be to follow the general advice of the ancient Latin writer, Horace, and stay out in the middle.

The "middle," in this case, would be a realistic compromise between (1) the temptation to escape the Washington tumult by crawling into a hole, pulling the hole in after you and industrially hibernating "for the duration," and (2) an equally strong temptation to go overboard on setting up an establishment of expensive experts with all the trappings of special industrial ambassadors to sit around Washington holding hands with a crowd of confused bureaucrats.

Rip Van Winkle, you will remember, was that gent who tried to dodge the harsh realities of a troubled domestic life by the simple process of sleeping it off. But when he finally woke up he found he wasn't much good any more. He was out of tune with things, creaking in the joints. The world had passed him by. For most practical purposes he might as well have drunk a fatal poison instead of the long-range sleeping potion which the weird little man of the mountain gave to him.

Don Quixote was an equally sad case. He got all excited over the sorry state of affairs in this world and resolved to *do something!* He was the crusader type. After much trouble, time and expense he only succeeded in giving himself a splitting headache as the result of beating said head against these same harsh realities of life which the more lethargic Rip tried to escape.

Rip and Don are fictional figures. But the problem which confronts industry today is far from fictional. Let us translate the situation to more modern and easily understandable terms. Recently, there was founded an association of municipalities which operate their own electric plants. The idea is to set up a Washington office and look after the municipal plants in the matter of priorities, price control, labor policies, etc. One municipal plant superintendent in a middle western state was approached and asked to come into the pool (and, of course, feed the kitty). His answer was typical of Rip Van Winkle. These are not his exact words; but they contain the gist of his argument, which has some pretty good points at that:

Why should I bother my city council and get our local taxpayers riled up over this Washington business which, as far as I can see, won't do us a bit of good? Why should I drain my budget to foot the bill for high-priced Washington experts to look after priorities which we're not going to get anyhow?

Our plant is sitting pretty. We got a maintenance and repair order for going supplies. That takes care of us. As for new business, we can get along without it. The defense business isn't in our area. The other kind of new business that is being offered these days is artificial and unstable. It is the type that will drop off just as soon as the boom is over and if we expand too much for it, we'd drop off with it. The private power companies would be buying out the plant for a price little better than junk value in less than a decade. After all, a municipal plant has to pay its way or the taxpayers want to know why.

No, as I see it, our best bet is to sit tight. In fact, I think it is quite fortunate that we have the chance to pass the buck to Washington for any inability to take on a risky kind of new business.

Much common sense to that statement. But also too much Rip Van Winkle complex for the safety of that municipal property as a going concern. So far, OPM's A-10 priority

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rating for repair and maintenance of electric utility industries, as well as municipal plants (under P-46, which is somewhat more liberal than the telephone companies' corresponding P-22), has worked pretty well. But will it continue to be satisfactory? The outlook is clear that it will not.

It has worked well enough in the past, first because the scarcity of raw materials has not bitten deeply enough to be felt in some utility trade markets; secondly, because indulgent manufacturers have been "carrying" along their good customers despite the latters' Rip Van Winkle attitude. But the A-10 rating is degenerating every day. It is now no longer a guaranty of delivery for material even for modest repair and maintenance. Tomorrow it will be hopelessly inadequate. A few months hence it will probably be quietly replaced by an allocations system. Then where will the Rip Van Winkle plant be?

The active cooperation of that municipal plant management is needed in drawing up an allocations plan to reserve *essential* materials for its future operation. If many such plants lie back and do nothing, there will come a day when the cupboard will be bare. The manufacturers will not be able to "carry" them or may turn to something else.

Again, who can tell how long the "emergency" will last? Suppose Hitler does clean up in Russia and makes himself undisputed master of Europe. Suppose, as a result, we are committed to continuing an intensified defense program over an indefinite period of years—possibly with active war on two oceans. Obviously, the present drain on raw materials for civilian industries would be greatly increased. Then Rip will wake up and find that he can't even keep going on his present basis. His plant will break down, become crusted with deferred maintenance and downright obsolescence. How will his local taxpayers like that?

No, the sensible thing for Rip to do is to get back in there and carry his load. He does not have to go after risky new business if he doesn't want to. He may take advantage of the responsibility of rationing which Washington is ready to assure if it is necessary. But meantime, it is necessary that he be awake, alert, and definitely among those present in Washington to be sure that his business is not plowed under and buried by default of a voice raised in its defense.

(Incidentally, Rip is prone to overlook his responsibility to the manufacturer. The consumer, the operating utility and the manufacturer are the three legs of a tripod upon which utility service must stand. That is true for public as well as private utility operations. Forgetting the manufacturer to the extent of letting him sink or swim is like sawing off one of the legs of this tripod of service. If continued the entire structure will inevitably topple over.)

Furthermore, Rip's problem is broader than the single field of priorities. He must have a voice in Washington to speak in his behalf on other vital emergency developments, some of which are just beginning to loom. For instance: Price control, anti-strike legislation, and labor regulation generally. Formulation of a plan for rationing service, if necessary. These are among the things which are happening and will continue to happen in Washington whether he is present or not. He had better be there or else!

* * *

But how far should Rip go? That brings us to a consideration of the other extreme. And that, in the final analysis, is a question of dollars and cents, of revenues and expenses, of balancing the possible benefits against definite commitments. In that respect we might consider briefly a typical Don Quixote.

Your correspondent knows of one. It is a modest scale industry which manufactures certain items of farm machinery. It is comprised of about a dozen company units in various stages of prosperity. This industry was organized several years ago along national lines by a live-wire leadership, which probably has become intoxicated by its own enthusiasm. Originally, it had one fairly competent Washington man to look after its interests. But recently it has accumulated a staff of six high-priced experts. Three of them are economists who do nothing but study "price trends" and other economic phenomena (related and unrelated) to the particular industry in question.

Needless to say, this is encouraged from the official side of Washington which has its own plentiful supply of starry-eyed idealists who like to sit around and converse with one another in terms of economic double talk. The taxpayers of the nation are paying for the Federal experts.

OPM COMMUNICATIONS SECTION SEEN

[EDITOR'S NOTE: *The following bulletin was received from Mr. Welch as this issue went to press.*]

"The OPM set-up for handling telephone matters in the future is, at this writing, supposed to be settled as near as anything can be settled before final and formal announcement. (Which means that it may not turn out this way at all.) The new layout would call for the establishment of a communications industrial section *within* OPM that would function under the aegis of OPM Division of Civilian Supply, which is headed by Joseph L. Weiner, former head of the Public Utilities Division of the SEC.

"Weiner, in turn, functions under the more or less nominal supervision of Leon Henderson, who divides himself between OPM and the Office of Price Administration (when he isn't attending congressional hearings and debating price-control legislation). The immediate head of the newly-proposed communications industrial section has not yet been determined. It might be Leighton H. Peebles, who has been connected with OPM since its inception.

"If this plan is adopted—and it may be before these lines appear in print—the priorities problems of the telephone industry, as well as radio and telegraph, under the new allocations plan policy of OPM will probably clear through this Communications Industrial Section. This set-up is quite independent, however, of the proposal advocated some weeks ago for a committee of the Defense Communications Board to act as a "clearing house" for all priorities problems of communications industries.

"You may recall that your correspondent was quite skeptical as to the workability of any such tie-up. Now it seems likely that OPM will insist on its own deliberations concerning communications priorities. If this is true, the DCB "liaison committee" will probably simmer down to a perfunctorily advisory organization."

But the management of that industry is scratching bottom for those on the private payroll.

The real point is that, in the final analysis, this industry will secure an allocation of materials equal to that which could have been obtained by a practical representation of two or three men who know their own industry and its needs better than a few ex-college professors. Here is an example of an industry which is probably going overboard and getting about the same results that would be obtained if it had not done so. As a brutal fact, it won't get very much. But then, anyone conversant with the priorities situation could have told them that long ago.

* * *

Yes, there is a limit to what should be spent not only on a Washington office but on an industrial set-up designed to deal with Washington. Here is where a combination of common sense and ordinary business thrift should be able to make a sensible decision. What is its net income? Is it justified in spending as much as one-half of 1 per cent in its dealings with the government?

It should not be difficult to reach a decision on some sensible budget limitation. And after that decision is reached a good, practical man—or two or three, if the scale of the enterprise warrants it—should be able to keep the ball rolling with due justice to the situation. Indeed, there are examples here in Washington of industrial representatives who have to act as a check-rein on the enthusiasm of their own principals, nationally organized in a home office in New York. Such good and faithful servants conscientiously advise the home office not to waste time and money going after the impossible.

Obviously, your correspondent should not presume to give specific advice at this time. It is a question of keeping one's business head on one's shoulders and doing first things first and important things foremost. A retail grocery association, for example, may be far more interested in price administration than in priority matters. Another group might have a primary interest in labor developments.

Coming to our own telephone industry, it is only fair to say that the Washington situation to date has been handled on a scale fairly consistent with the importance of the industry's interest in developments in Washington. Those interests will probably expand in the near future. More help may be needed. As time goes on, with good luck, some of that help may no longer be necessary. It is entirely a question of staying in the middle and balancing the opposite dangers of an insufficient crew as contrasted with dead-head passengers on a gravytrain.

* * *

Radio threw a birthday party a few days ago for the National Broadcasting Co. It was the 15th anniversary (and, my, how big the lad has grown for his age). All the big shots and little shots foregathered for the festivities. Backslapping and congratulations were in order.

President Roosevelt tossed out the first bouquet in the form of a letter telling the radio boys what a fine job they are doing, etc. Chairman Fly promised pie in the sky, bye and bye. Brass hats from the Army and Navy joined in the chorus. What the radio men took the greatest consolation from, however, was Under Secretary of War Patterson's figurative rendition of "Stay As Sweet As You Are." It helped somewhat to quiet vague fears that the administration is fixing to swing a different tune—something like, "There Will Be Some Changes Made."

The radio press hailed the under secretary's statement as an assurance that there would be no seizure by the government or interference with radio broadcasting under the extensive emergency powers of Section 606 of the Communications Act. But rumors to the contrary continue to fly about the country on a sort of ghost-to-ghost network. The following is a cryptic little paragraph which appeared in a certain confidential, weekly Washington letter which goes out to various public utility industries:

"Assistant Secretary of War Patterson has assured the radio industry that the federal government wants the radio set-up to remain just as it is. Nevertheless, communications circles in general are uneasy over rumors that the FCC and the Army are considering legislation to increase the government's 'emergency powers' over radio and to some extent over telephone and telegraph services. Section 606 of the Communications Act gives the President broad authority to proclaim government control over the physical operation of radio stations, even prior to active belligerency of the U. S. in a declared war. But the authority of the government to control program material is not clear. In the case of the wire services, the President has authority only to insist upon preference for government communications 'during

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WISE SALES TIPS

Visual Aids

By W. L. HUDSON

NLY about 10 per cent of the knowledge received in the mind is transmitted through the ear while 90 per cent is through the eye, according to the Chinese. Regardless of the accuracy of these percentages, we know from our own experiences that there is truth in the old saying, "Seeing is believing."

Some salesmen carry samples of their wares to show, or to demonstrate their uses, to prospects. But this is not practicable in some lines. The next best thing is pictures. As the prospect looks at a picture, the salesman can make an oral presentation, thus simultaneously appealing through the eyes and ears.

When we look at a picture, our imagination is stimulated, and, without conscious effort on our part, some of our senses begin to function.

Pictures of foods are a good example: "Aunt Jemima's Pancakes," "The Ham What Am," beer, pickles, salads, etc., stimulate appetite for the things pictured.

A good test is to listen to a radio speech and then read the same speech. You will find that numerous details were missed in the listening process.

Salesmen will find it profitable to develop skill in using visual aids along with their oral presentations.

[EDITOR'S NOTE: This is the sixth article in a series; the last one appeared in the August 16 issue.]

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TENNESSEE ASSOCIATION'S

Seventh Annual Meeting

ANOTHER fine convention was held by the Tennessee Independent Telephone Association at the Heritage Hotel in Nashville, November 17 and 18. There was a representative attendance from all parts of the state at this year's annual meeting and keen interest was shown the program and round table discussions.

A varied display of equipment and supplies was provided by representatives of nine different manufacturers and supply houses and much attention was given to this phase of the convention by the visiting telephone men.

A. E. Reynolds, commercial superintendent of the Inter-Mountain Telephone Co., Bristol, was elected president for the ensuing year; and Chas. Stanton, of Cookeville was chosen secretary-treasurer. Three vice presidents were elected, namely: S. B. Dibble, Jr., Cookeville; J. J. Odle, Parsons, and J. L. Dickens, Unionville. Other directors for 1941-42 include: Kelley McNish, Bristol; W. R. Gilbert, McKenzie; J. W. Vaughan, Waynesboro and Jas. N. Cox, Cookeville.

CHAS. STANTON, Cookeville, was elected secretary-treasurer of the Tennessee association.

A. E. REYNOLDS, Bristol, was elected president of the Tennessee association for the coming year.

President B. H. Piepmeier—general manager of the Southern Continental Telephone Co., Cookeville—in his welcoming address outlined in brief the work of the association, what it has done for its members and pointed out some things the association may do for its members in the future. He stressed the advantages of being a member of the association as compensation for the moderate annual dues required of the average Independent company, citing specific cases in which the association has already saved every telephone company many times their annual dues.

Following Mr. Piepmeier's address as president, he read the report of the secretary-treasurer since Secretary-Treasurer W. G. Snapp, of Bristol, was unable to be present.

The activities of the national association were presented by Louis Pitcher, of Chicago, executive vice president of the United States Independent Telephone Association. Mr. Pitcher discussed several national issues affecting all telephone companies, also important aspects of the problems involving priorities, allocations and rationing of telephone service.

The chairman of the Tennessee Railroad & Public Utilities Commission, Porter Dunlap, of Nashville, made a short talk in which he asserted that every telephone company, regardless of size, would be of vital importance to any emergency that may befall this country. In concluding, Mr. Porter assured full cooperation of the commission to all development by telephone companies of Tennessee.

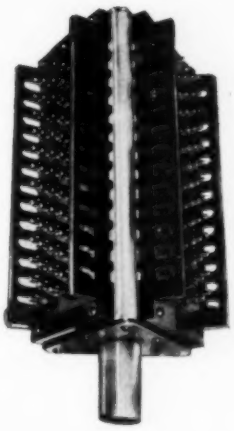
S. B. Dibble, Jr., general manager of the Southern Continental Telephone Co., Cookeville, presented up-to-date information regarding the prospects of getting materials and priorities as they apply to telephone companies.

President-Elect A. E. Reynolds, commercial superintendent of the Inter-Mountain Telephone Co., of Bristol, presented many reasons and needs for every Independent telephone company to have increased revenue under the new and rapidly changing conditions. Mr. Reynolds

(Please turn to page 27)

B. H. PIEPMEIER, Cookeville, retiring president of the Tennessee association.

IN designing the new Uniflex Cable Terminal, Cook engineers recognized the importance of developing a compact, light weight, welded pressed steel unit structure, which would require a minimum of space and permit complete accessibility and a maximum effective terminating surface. Structural strength therefore became an important design factor as the Uniflex terminal unit must aid in supporting the weight of lead covered cable and accommodate the weight of adjoining units mounted in tandem in horizontal or vertical position. It must also sustain physical stresses to accommodate wall cabinet, pole, or parkway mounting. Rigidity is likewise important in order to prevent distortion with resultant air leakage and insulation breakdown due to gasket fracture.



Uniflex Cable Terminal

Uniflex was therefore laboratory "Tested for Strength" before the design was approved for production. Guess work was eliminated and the efficiency of the material, structural design, and welded construction was definitely evaluated by the Tinious Olson 30-Ton Hydraulic Testing Machine. Send for Uniflex Literature at once. Cook Uniflex Cable Terminals are sold by all telephone manufacturers and supply houses. Cook Electric Company, 2700 Southport Avenue, Chicago.

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By DICK HALLER
Public Relations Director,
Mutual Telephone Co., Honolulu, Hawaii

PRIORITIES, SERVICE RATIONING

Problems in Hawaiian Islands

Telephone companies in the United States are having their share of defense experiences and problems, but the Mutual Telephone Co. in Hawaii is faced with a concentration of problems—in a surprisingly small area. Telephone development is already six years ahead of normal growth.

NO OTHER area of equal size in the entire United States or its possessions has experienced as much defense activity as Oahu, principal island of the Hawaiian group, on the south shore of which the city of Honolulu is spread. Its longest dimensions are about 40 miles east to west and about 26 miles north to south. Its area is slightly over 600 square miles and the shore line just under 150 miles. When the national defense program was getting under way early in 1940 the population of the island stood at 257,500, living in 53,225 dwellings. Of that population 179,000 were in Honolulu, which covers roughly about one-eighth of the entire island.

ROLAND W. KILBOURN (left), equipment engineer, and W. I. HARRINGTON, commercial manager, both of the Mutual Telephone Co., confer on phases of expansion made necessary by the concentrated defense program in Hawaii.

Oahu is known as the Gibraltar of the Pacific. On the island are Pearl Harbor, America's greatest naval base; a mammoth new naval air station just being completed and another of even greater size now being started; the army's Schofield barracks, Wheeler Field, Hickam Field, about a half dozen coast artillery posts and Fort Shafter, headquarters of the Hawaiian Department.

Enlargements and improvements of all these posts have been going on with feverish haste for the past 20 months. During that time large portions of the United States fleet have been continuously in Hawaiian waters, with personnel varying from 20,000 to 45,000 men based at Pearl Harbor in addition to the navy yard forces.

Information regarding exact numbers of army and navy men, defense workers, money being spent and nature of projects is at least partially secret. However, thousands of officers and their families have poured into Honolulu, seeking living accommodations, and thousands more defense workers have arrived with the same needs. At the same time even greater numbers of local persons have quit old jobs for more pay on defense works.

In addition to this, Honolulu is the hub and shipping center of more projects on the other Hawaiian islands, the equatorial islands and at Midway, Wake and Guam.

All this is believed to have raised the population well above 300,000 and it has increased greatly the purchasing power of the community. Both directly and indirectly, defense has stimulated business to levels unprecedented. As a consequence, Honolulu is a boom town today, in all senses of the word, with some benefits and many present and future problems to be faced.

What effect have such conditions had on the telephone system and telephone service? It is doubtful if any telephone system in the entire country has faced such problems and felt as great an impact from defense activity as the Mutual Telephone Co. of Honolulu. Honolulu has both army and navy expansion, a large group of contractors; also local industrial and business capacity is being utilized to the utmost. Honolulu's docks, trucking companies, the railroad, quarries, lumber yards and utilities are strained to their limits to meet the demands of the defense program.

Indirect effects are considerable, too. The average man is earning more money and wants to spend it. New furniture, new automobiles,

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better clothes and other things have stimulated civilian business. Many families, who could not afford telephones before, had them put in when the pay envelope became fatter. A housing shortage due to the influx of new families resulted in a building boom; and telephones, of course, went into a majority of the new houses.

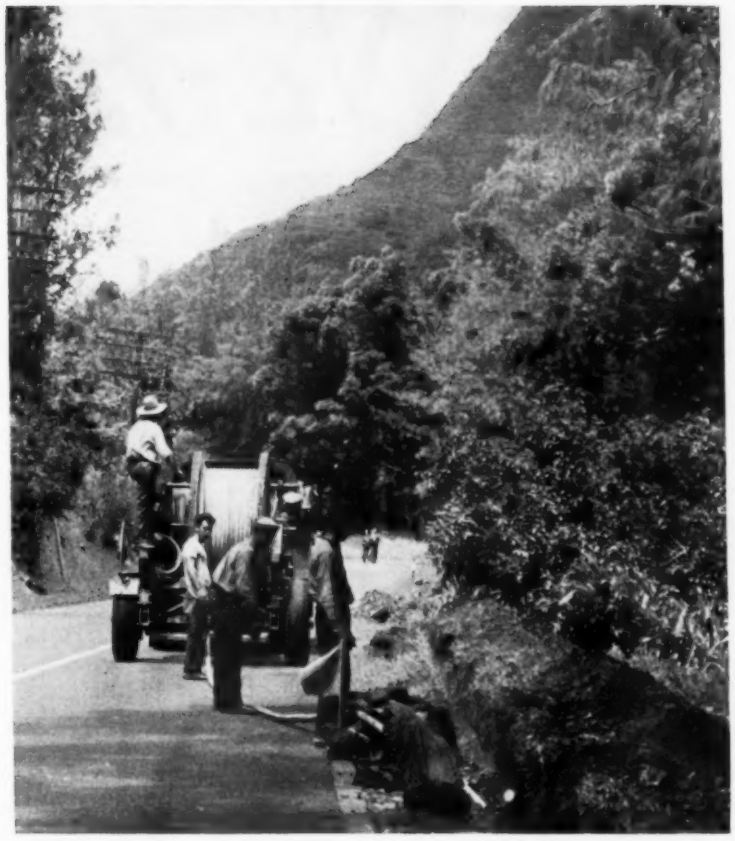
The defense program began earlier in Honolulu than in most places with projects already on paper that army and navy had been trying to get for some time. The Mutual company began to feel the effects almost at once, although the growth curve became steeper and steeper as the program got further and further under way.

As of January 1, 1940, about the time the program was starting, there were 35,107 subscribers on the five islands where the Mutual company's systems operate. Twenty-one months later, on September 30, 1941, there were 44,342—*a gain of 9,235, or more than 26 per cent.* Practically all this growth was on the island of Oahu, which started the 21-month period with 28,079 subscribers and ended it with 37,322, exclusive of private line and service stations.

Prior to the defense program the normal growth rate was about 250 stations per month; in September, 1941, a net gain of 893 subscribers was registered with a total of more than 4,700 changes.

The calling rate made even sharper gains. Business has been moving at a greatly accelerated pace in Honolulu; people have more money and are doing more things. The housing shortage caused much doubling up, renting of rooms and subdividing of dwellings into small apartments. This resulted in concentration of more people per telephone and placed heavier strain on trunking and exchange facilities. At the end of 1939 the average number of exchange calls per day in Honolulu was 190,000; for September, 1941, the average number was 310,000—*a gain of 120,000 calls daily, or 62 per cent.*

Calling rates for inter-island and trans-pacific radiotelephone service also went up sharply. In 1939 there were 36,701 paid inter-island calls; in 1940 there were 43,661, and in the first nine months of 1941 there were 41,595. Trans-pacific calls climbed even faster. There were 5,175 in 1939, while the total for 1940 was 9,687. For the first nine months of 1941 the number of calls was 12,933. Needless to say, much important defense business between Hawaii and the mainland is transacted by radiotelephone because of the vital time-saving factor.



One of Mutual company's crews laying a 200-pair cable from Honolulu to an outlying community adjacent to a new large naval air base. Just beyond the hills in the background is the famous 700-foot pali or cliff, over which King Kamehameha's army pushed the Oahu defenders. (Pushing the new cable over was a big job, too.)

These growth rates in stations and calling soon began eating into the safety margins that have always been prudently maintained by the Mutual company. Late last summer the subscribers' curve crossed the point it had been expected to reach in 1947. In other words, the system had jumped six years ahead of normal growth.

The company's normal expansion program was speeded, and 1941 saw some 90 major projects put under way. The total expansion program of the company is estimated at $2,116,626, of which amount $1,866,626 are for additional plant facilities and $250,000 are for the new and ultra-modern four-story addition to the company's main building to be completed early in 1942. Incidentally, that building is being made bomb-splinter and fragment-proof because it is located not far from legitimate military targets, and it also has some sabotage protection features.

The sharp gains scored in the calling rate began to catch up with trunking and exchange facilities early in 1941. Subscribers began getting busy signals occasionally, and sometimes frequently on the first and second digits of the numbers they dialed. The Mutual company has maintained splendid service in the territory of Hawaii for over 58 years, keeping well abreast of new developments and ahead of community growth. This successful history helped some—but a portion of the public is always fickle, and it was not long before complaints welled up about poor service.

Meanwhile the priorities system began to be felt as it gradually affected deliveries of new equipment. And there was another factor that ate into equipment reserves at times: Army and navy posts maintaining their own telephone systems and being expanded rapidly frequently called on Mutual to borrow equipment until their own orders, often placed late, could be delivered.

(Please turn to page 35)

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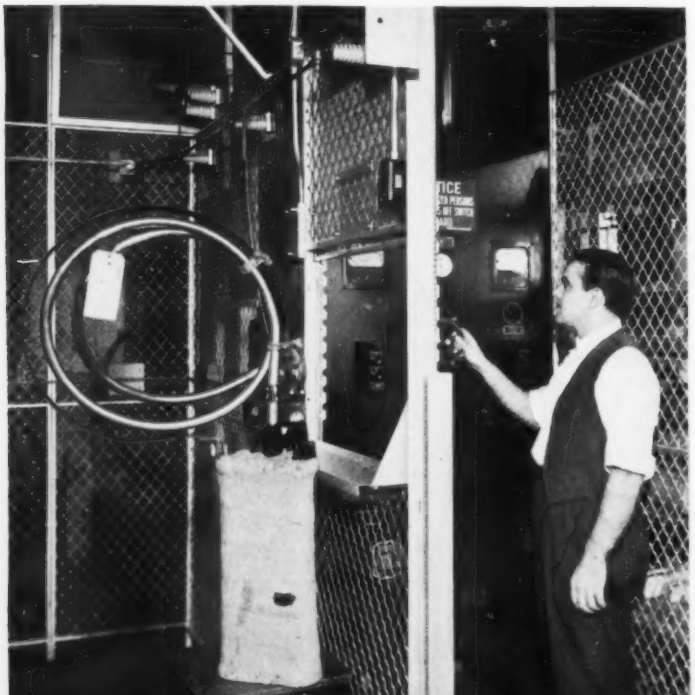
We have our G

As they come off the wiring line, switches of all types are tested with the test set shown above. By means of the pin jacks and patch cords, the switch under test can be subjected to any exchange conditions the inspector desires.



This high potential "breakdown" test subjects equipment to voltages from 100 to 10,000, as desired. If cage door is opened during test, both transformer and test bus bar "go dead," preventing any chance of accidental shock to the operator.

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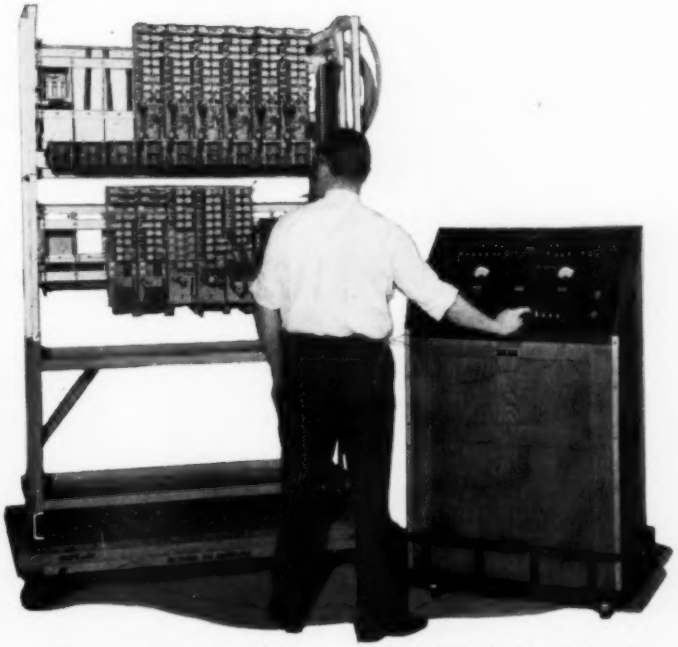
to duplicate every possible exchange condition to
us will be subjected in the field. If any defect shows
the unit again undergo test before it gets a

urance when you buy Automatic Electric equip-
isfactorily economically for many years of useful,

P.B.X.'s and central office manual boards of all types are checked with the testing equipment shown above. Functional drawings on the designation strips permit the inspector to set up any desired exchange condition without the necessity of using blueprints.



After an automatic switch has passed an individual wiring test and an operating test when mounted and cabled into a board, it is subjected to a final operating test under extreme line, voltage and dial speed conditions, using a portable test set as shown above.

IC ELECTRIC
GER STE ACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

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XUM

The Plant Man's Notebook

By RAY BLAIN
Technical Editor

MY GOOD friend, C. F. Robinson, Signal Corps telephone engineer stationed at Atlanta, Ga., sends the accompanying photograph of a cable-splicing headache. I continue to marvel at the ingenuity of the cable splicer and find it difficult to understand how he can possibly clear up a wire puzzle of this nature. This, after having watched cable splicers at work for over 30 years!

* * *

Geo. M. Kloidy, in the Nebraska Telephone Association's bulletin for November, points out that according to a U. S. Census Bureau report only one farmer out of four had a telephone in 1940 as compared to 1930 when one farm home out of three enjoyed telephone service. In contrast with this, one farm home in every three was lighted by electricity last year as compared with less than one in seven in 1930.

This gives us something to think about and perhaps someone will have ideas as to how paying rural telephone service may be promoted.

* * *

An interesting discussion took place in the plant conference of the last national telephone convention as to the best method of heating an unattended automatic telephone exchange. No decision was reached as to whether gas, electricity or oil is best nor the type of controls considered most desirable. We would be pleased to hear from anyone having had practical experience with this problem.

* * *

The Telephone News, published by the Bell Telephone Co. of Pennsylvania, as an insert in its November issue, printed a chart giving detailed instructions on the use of recommended first-aid remedies. This is excellent information and by its practice many lives will undoubtedly be saved while awaiting the doctor's arrival.

* * *

I happened to overhear an interesting argument the other day as to whether steel or locust pins in a crossarm would carry the greater strain in a country where the ice-loading is heavy and high wind is prevalent. While it is true, no doubt, that steel pins will carry a greater strain, I personally have never seen a good locust pin break on a straight lead. Special reinforcement is naturally required on corners by the use of steel pins and back bracing or double crossarms.

* * *

On November 20 *The Washington Post* reported that the renovation of Temporary Building "E," an old world war structure which is being occupied by the OPM Priorities Division, has been delayed because the contractor had difficulty in obtaining priorities on materials. This sounds odd—but then whoever saw a bootblack with his shoes shined.

* * *

I recently received an interesting letter enclosing photographs from Fred S. Florance, general manager of the Highland Telephone Co., Monroe, N. Y., in which was described a special trailer recently fabricated locally for use on their system. This is a most interesting item and will be described in detail on this page in the near future.

* * *

The other day I chanced to examine an 18-inch bell hanger's bit which was being used by a telephone installer, and found a small hole through it about an inch from the point. I learned this was used to place wire through walls after the hole has been drilled. The insulation was removed for about an inch from the ends of the wires, which were then inserted in the hole. The bit was then used as a needle to thread the wires through the wall. This simple little feature will certainly save a lot of time and bother.

Hunter Gary Industry Advisor on Rockefeller Committee

The Associated Telephone & Telegraph Co., the Theodore Gary & Co. subsidiary which operates telephone properties and engages in telephone construction and engineering outside the United States, has designated Hunter L. Gary, chairman of its board, to assist the interdepartmental committee organized by Nelson Rockefeller, coordinator of inter-American affairs, to study communications in the Amer-

HUNTER L. GARY

ican republics. Frank S. Spring, president of the Associated company, was named alternate to Mr. Gary on the committee advisory setup.

In making the appointments, the executive committee of the Associated company in a message to Mr. Rockefeller from Mr. Gary stated that the company desires "to cooperate with the government in every way possible" to aid the defense program.

Mr. Gary has been most active and constructive in many important phases of the defense program of the United States, particularly in communications matters. He has been working closely with the highest officials of the war and navy departments and has carried out important communications surveys of a highly confidential nature for the army, and the navy at their request. He has likewise been active on many important assignments for other leading defense agencies.

▼ ▼

Discard Telephone Slogan

The New York Telephone Co. has discarded its slogan, "Don't Write—Telephone," because of increasing national defense demands on toll line facilities. In fact, employes have been requested to "Use the mail wherever time permits this method of communication."

Constructed To Outlast The Cable

Reliable "RU" CABLE TERMINALS

—are ruggedly constructed to render long, dependable service. A reversible sliding zinc cover provides maximum protection against weather and permits installation of the terminal with stub at top or bottom. Wire connecting and periodic inspection is simplified by a flat fanning face plate. Detachable mounting bracket greatly facilitates installation and assures a firm mounting. Cast iron cable chamber and all steel parts are hot dip galvanized. Build for the future with this widely specified terminal.

Request a Sample for Inspection.

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OVER 30 YEARS SERVICE TO THE UTILITIES
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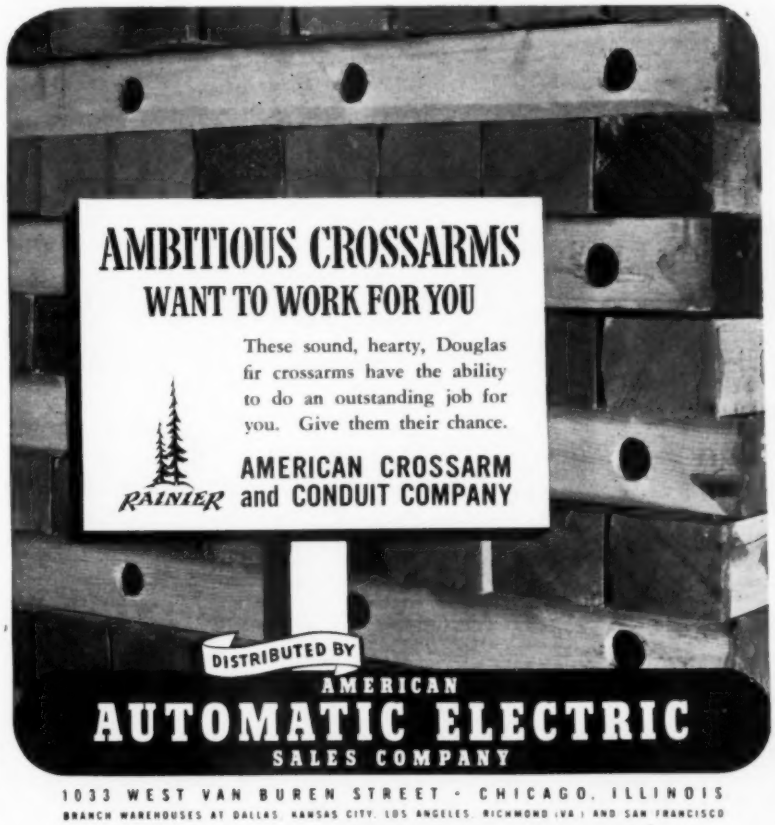
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WANT TO WORK FOR YOU
These sound, hearty, Douglas fir crossarms have the ability to do an outstanding job for you. Give them their chance.
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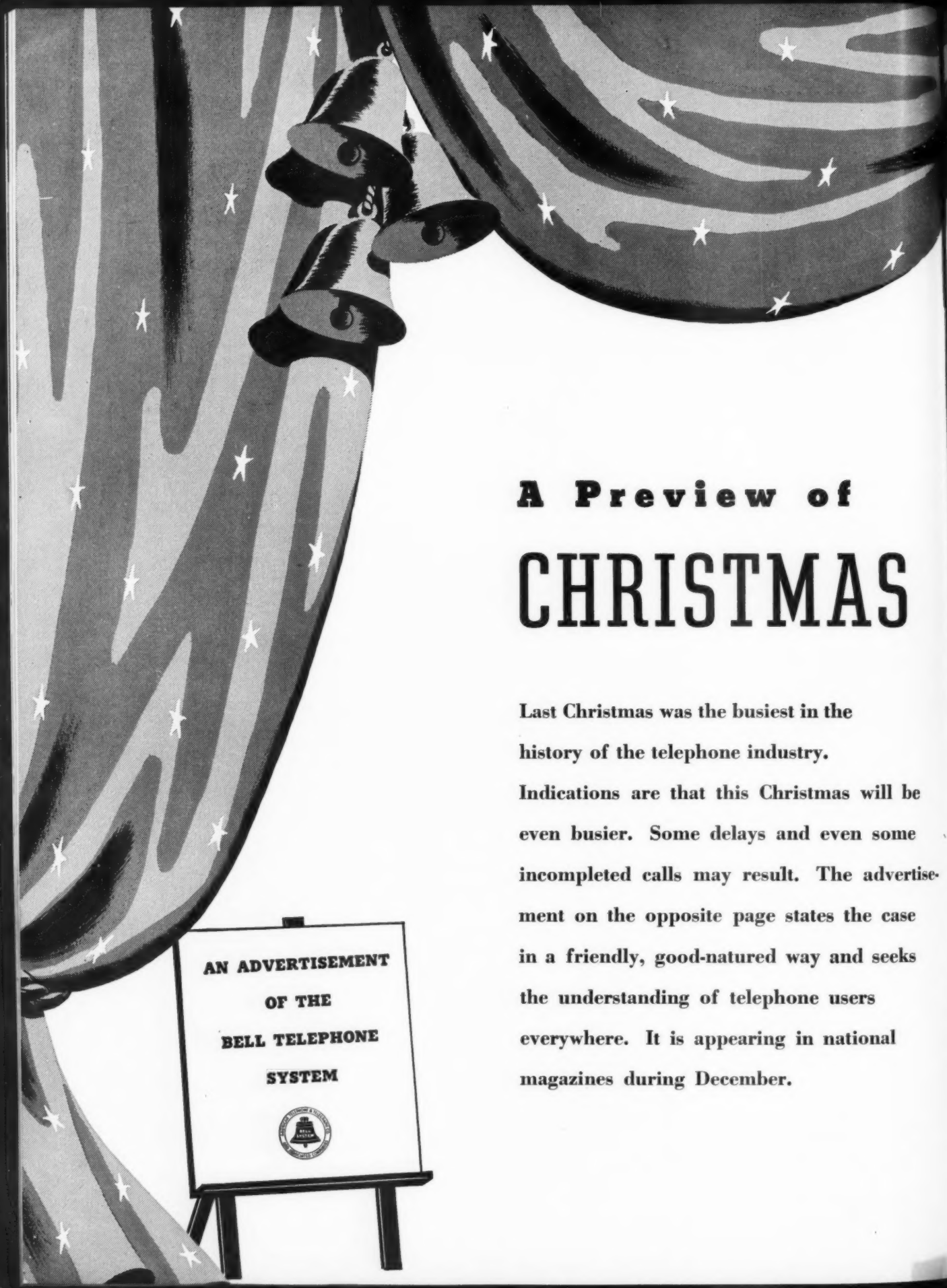

A Preview of CHRISTMAS

Last Christmas was the busiest in the history of the telephone industry. Indications are that this Christmas will be even busier. Some delays and even some incompleted calls may result. The advertisement on the opposite page states the case in a friendly, good-natured way and seeks the understanding of telephone users everywhere. It is appearing in national magazines during December.

XUM

That's the situation your telephone company faces every Christmas. That's why there may be delays on some Long Distance Christmas calls.

• Last Christmas Eve and Day the wires were jammed. The switchboards were manned by regular and extra operators working all through the holiday. Long Distance telephone calls were three, five and at some places *eight* times normal.

We're glad so many folks want to exchange friendly greetings across the miles at Christmas — but sorry that, because of it, we can't supply service as good as usual.

We expect the biggest rush of calls we've ever had this coming Christmas. We'll do our best to prepare for it. But some calls will be slow. Some may not be completed. For these, we ask your patience and understanding. . . . *Thank you, and Merry Christmas!*

BELL TELEPHONE SYSTEM

The Operator's Corner

By MAYME WORKMAN
Traffic Supervisor
The Illinois Telephone Association

IT IS GRATIFYING to observe that differences between toll center and tributary operators in handling long distance calls are becoming less frequent from year to year. Attendance at district meetings and state convention traffic schools, where problems of toll centers and tributaries are freely discussed, have been helpful in creating better understanding of mutual problems.

In these schools of instruction it is explained that long distance calls originating at tributary exchanges are accorded the same attention and treatment as calls originating in the toll center exchange. If (and when) a toll center operator is slow in accepting or advancing a tributary operator's long distance call, the tributary operator is usually correct in assuming that calls originating in the toll center exchange are being delayed in a like manner.

The order in which long distance calls are completed is based upon the classification of the call and the filing time. For example, an emergency call takes precedence over a cut-off; an appointment call on which the appointment has been previously arranged takes precedence over a WH report, etc.

Where there are two or more calls, reports, or orders of the same class, the order of precedence is determined as follows:

(1) On first attempts, the precedence on OUT tickets is the filing or acceptance time or the time of the first report; on report tickets, the filing time, and on IN tickets, the received time.

The following exceptions apply to this rule:

(a) If a customer, before an attempt is made, requests that his call be held until a later specified time, the precedence is the time at which he asks to have his call tried.

(b) On any call of a sequence other than the first, the precedence is the time at which the preceding call of the sequence is completed or otherwise disposed of. (Hence—in answer to question number five — if the toll center operator had a call with an earlier filing to the tributary exchange she was privileged to complete this call before proceeding to complete the tributary operator's sequence calls).

(2) On subsequent attempts, the precedence is the time at which the attempt is due or the time at which the customer requests a report, gives an order, or agrees to have his call tried.

The following are exceptions to this rule:

(a) On subsequent attempts to secure a busy called line at the end of three, six, and nine minutes from the receipt of the first report of BY, the precedence is the time of the first report.

(b) A subsequent attempt following the receipt of a WH report (except an attempt resulting from a delay in reaching the calling party) takes precedence over the WH report; for example, an attempt after the OTC has reached a calling station which was BY, DA, or OD.

(c) If two or more calls have the same attempt time, precedence should be given to the call filed first.

Operators, particularly in toll center exchanges where the major portion of long distance calls are handled, should be familiar with the precedence schedule for the various classes of calls in order that all long distance calls may be completed in accordance with the order in which they are classified.

Questions from Illinois Operators

1. Ticket charged to a third number. What is the procedure in case the charge is not accepted by the third number and the calling party also refuses to pay for the call?
2. On a call "collect after conversation" to a coin station, where is this shown on the ticket?
3. Why is it necessary for the operator to ring number and secure information about party called instead of connecting the calling operator with the number?
4. On a collect station-to-station call, if the PBX operator refuses to accept the charge, is this a chargeable report if the call is canceled?
5. Can a toll center operator take the circuit when a sequence of calls from a tributary to their toll center has been made and only part of them are talked on?

(Please turn to page 33 for the answers to these traffic questions.)

▼ ▼

Report That REA Is Hoarding Copper; Inquiry Demanded

Although the Office of Production Management asserts a serious shortage of copper exists, it has been reported in a Chicago newspaper that down in the cotton fields of eastern Texas 23 carloads of copper have been dumped by the Rural Electrification Administration and hoarded by it for expansion of REA lines. It is said the copper was deposited in the fields in the first week of October.

The OPM has forbidden use of copper in the construction industry since November 1 and in more than 100 civilian articles after January 1.

The charge of copper hoarding by REA was presented to Congress December 1 in a House floor speech by Rep. Thomas D. Winter (R. Kans.) in which he demanded an investigation. It was reported that later three Texas Democrats told Vice President Henry A. Wallace, chairman of the Supply, Priorities, and Allocations Board, that

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they were against the allotment of one pound of copper to the REA until all arms needs had been met. After that they advocated allocation of copper on an equality basis to public and private power groups.

Representative Winter said the huge batch of copper has been lying in the open fields at Gilmer, Quitman, Emory, Troup, Mount Pleasant, and Henderson, Texas. It is in the form of heavy cable to be used as high tension transmission lines to service existing electric power cooperatives whose members already are receiving electric current.

Rep. John Rankin (D. of Miss.), before the House of Representatives December 2, declared that Representative Winter's attack on rural electrification was "vicious and unjustified."

Representative Rankin said he had been advised by the REA that the copper wiring now lying unused in East Texas was in the hands of a contractor building a transmission line which would utilize electric power made from East Texas gas wells. Construction is being delayed, he said, because of government priorities on other necessary materials.

Tennessee Annual Meeting

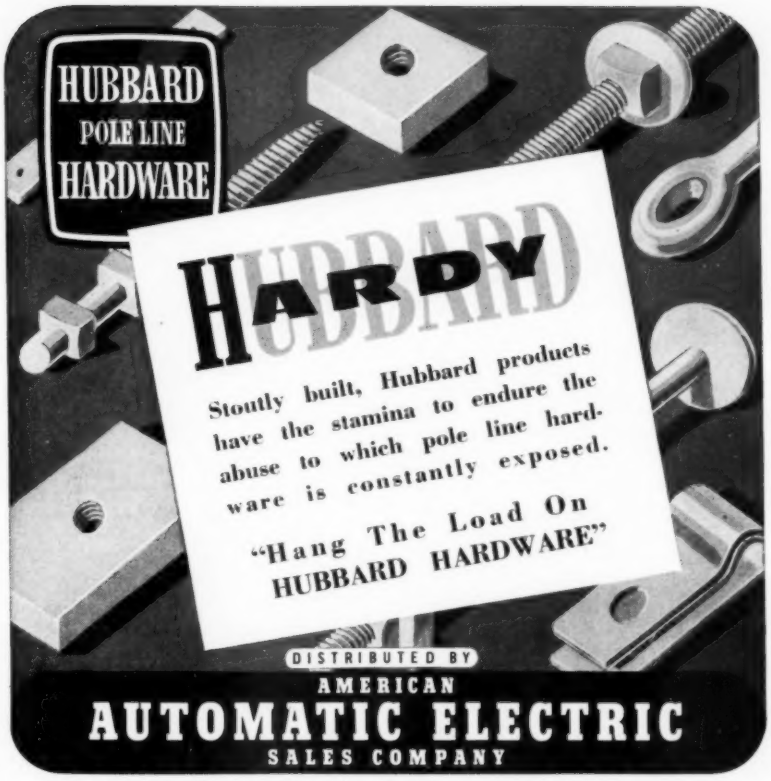
(Concluded from page 14)

spoke in place of Kelley McNish, president of the Inter-Mountain company, who was unable to attend the convention.

First Lt. William L. Davis, Communication Officer of the 130th Infantry of Tullahoma, Tenn., presented a very fine display of equipment that is now being used by the front line infantry and explained some of the methods followed and the instruction that is being given soldiers in connection with their training in communications.

The association dinner, Monday evening, was followed by some special entertainment given by dancing girls and a high class magician. The dinner and special entertainment were highly appreciated by all in attendance.

Tuesday, November 18, was given over to round table discussions of plant, traffic, commercial and accounting work. The discussions were well attended and the questions asked and discussed in detail showed much interest by all in this feature of the convention program.



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BRANCH WAREHOUSES AT DALLAS, KANSAS CITY, LOS ANGELES, RICHMOND (VA.) AND SAN FRANCISCO

"That's Good News"
A REPORT from any department head showing a substantial cut in costs is always "good news" to an executive.
Many such reports from Tool Supply Departments follow the adoption of Vacuum Grip Pliers as standard equipment in place of other makes.
Instruct your Purchasing Agent to write us for details of Vacuum Grip "high mileage" Economy and our 30-Day Trial Plan.
FORGED STEEL PRODUCTS CO.
Newport, Pa.
Vacuum Grip Pliers
PROFESSIONAL LINEMAN PLIERS
The choice of veteran linemen.
Length 6" — $2.00
Length 7" — 2.50
Length 8½" — 3.25
Lineman's or company name etched FREE on handle.

Maintenance Practices

(Concluded from page 10)

connection or short across the pair at the far end is solid. It is also necessary that accurate records, indicating the length and gauge of all cables, be maintained in the exchange to be used as a check on the length of the loop in comparison with that obtained from the measurements on the bridge.

The Varley loop method, using one good and one faulty wire of the same gauge with the "A" and "B" bridge arms equal to locate a fault, is shown in *Fig. 3-B*. With this method, the faulty wire must always be connected to the "R" terminal on the bridge.

The Varley loop method, using one 22-gauge faulty conductor and one 19-gauge good conductor with the "A" and "B" bridge arms unequal, is shown in *Fig. 3-C*. Location tests may be made with this method on any combination of good and faulty wire by applying the correct feet per ohm according to the wire size of the conductors to be tested.

Trouble may be encountered where the cable is made up of two different gauges as indicated in *Fig. 3-D*. In this case, 4,820 feet of 22-gauge cable extend from the central office and at this point is spliced to 840 feet of 19-gauge cable. By calculating the 22-gauge cable at 31 and the 19-gauge at 62 loop feet per ohm, we find that "L" equals 169. If a Varley of 20 were obtained, it would indicate the fault to be in the 22-gauge section of the cable. Deducting 13.5, which represents the 19-gauge portion, from the Varley of 20 equals 6.5 ohms.

This value of 6.5 ohms represents the resistance from the junction of the two cable sizes back to the fault, or 6.5 by 31 equals 201.5 feet. If the Varley or "R" reading is less than 13.5, the fault will then be in the 19-gauge section. For example, if R = 5, then the distance from E to the fault 5 by 52 feet per ohm equals 310 feet.

The Varley loop test as used for locating solid or high resistance shorts or crosses is shown in *Fig. 3-E*. One wire of the faulty pair is connected to the ground terminal of the bridge while the other side of the shorted pair is connected to the "R" terminal of the bridge.

(Another installment soon)

▼ ▼

Texas Exchange Sold

The Westover (Texas) Telephone Co., which has been under the management of W. M. Campbell, has now been purchased by Mr. Campbell from G. L. Humphrey who owned and operated the exchange for a number of years, but recently decided to sell the property.

▼ ▼

Oklahoma Association Holds Meeting at Fairfax

Membership in a state telephone association is of more value than ever before, since it is necessary for members of the industry to keep themselves and their subscribers fully informed on developments of the national defense program, declared C. E. Devin, of Apache, Okla., president, Oklahoma Telephone Association, before delegates to the district meeting of the association at Fairfax, November 21. The meeting was well attended with 70 telephone people present.

Speaking on the subject, "Maintenance and Cooperation with National Preparedness and Defense," Tom Marts, manager, Western Light & Telephone Co., Watonga, declared that telephone people must accept government regulations without complaint, including those relating to taxation and priorities.

Curtailment of production and distribution of materials and commodities for non-defense uses will increase, he declared, and telephone managers and employes should prepare subscribers to accept certain inconveniences in service, caused by difficulties in securing

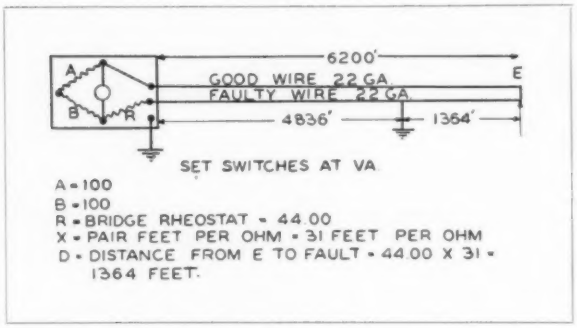

Fig. 3-B. Varley location for ground of same gauge wire.

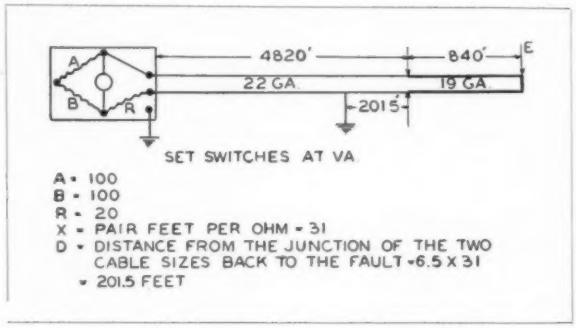

Fig. 3-D. Varley location for cable having two sizes of wire.

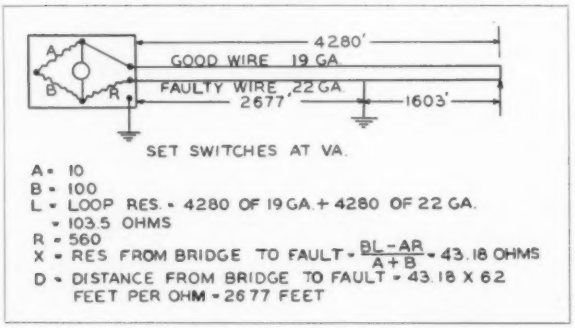
A
B
R
4280'
GOOD WIRE 19 GA.
FAULTY WIRE 22 GA.
2677'
1603'
SET SWITCHES AT VA.
A = 10
B = 100
L = LOOP RES. = 4280 OF 19 GA + 4280 OF 22 GA. = 103.5 OHMS
R = 560
X = RES FROM BRIDGE TO FAULT = $\frac{BL-AR}{A+B}$ = 43.18 OHMS
D = DISTANCE FROM BRIDGE TO FAULT = 43.18 X 62 FEET PER OHM = 2677 FEET

Fig. 3-C. Varley location for grounds of different gauges of wire.

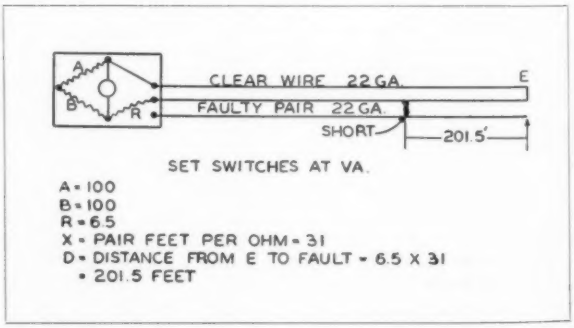

Fig. 3-E. Varley location for solid or high resistance shorts or crosses.

necessary materials for extensions and repairs.

A demonstration of approved cable construction and splicing methods, presented by J. W. Ross, division plant superintendent, Southwestern Bell Telephone Co., Tulsa, gave the telephone people new ideas on how they can conserve material and make their present cable facilities more efficient and last longer in the face of the national emergency.

Callie Lee, cashier-chief operator, Oklahoma Telephone Co., Fairfax, reminded the telephone people that the ever-watchful, efficient and smiling service of the women operators in telephone offices throughout the country is an essential to success at all times. To fit into the organization, operators must be willing, intelligent, quick to learn and should possess calm temperaments.

Many telephone employes look upon the making of reports as something of a "headache," declared C. W. Young, auditor, Oklahoma Telephone Co., Broken Arrow, in discussing his subject, "The Importance of Rendering Accurate Reports by Commercial, Traffic and Plant Employes."

Mr. Young explained that the primary purpose of requiring these reports is to enable the general office to keep accurate corporate records and to render intelligent reports to regulatory bodies, as required by law.

J. W. Walton, vice president, Oklahoma Telephone Association, Fairfax, was toastmaster at the luncheon. The address of welcome was delivered by L. A. Harrell, mayor of Fairfax, and the response was given by H. W. Hubenthal, secretary of the association. The high quality of the telephone service rendered at Fairfax by the Oklahoma Telephone Co., host to the meeting, was praised by L. W. Evans, president Fairfax Chamber of Commerce. Music and entertainment were provided at the luncheon.

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October Station Gains Of General Telephone Corp.

The General Telephone Corp., New York City, reports for its subsidiaries a gain of 3,164 company-owned telephones for the month of October, as compared with a gain of 2,424 telephones for the same month in 1940. The gain for the first 10 months of 1941 totals 37,641 (exclusive of purchases and sales) or 7.07 per cent. This compares with a gain of 24,116 telephones or 4.79 per cent for the corresponding period of 1940.

The subsidiaries now have in operation 569,667 company-owned telephones, according to H. V. Bozell, president of the General corporation.

ONE IN A THOUSAND

That bright orange jersey is a familiar sight to utility executives who depend on ASPLUNDH for Economical Line Clearing. He is just one of a thousand expert field men whose services guarantee perpetual freedom from telephone line failure due to trees.

One of our several different contracts is sure to exactly meet your requirements and budget. . . .

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TREE EXPERT COMPANY

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Chicago, Ill. Randolph 7773	Binghamton, N. Y. Binghamton 4-5314	Columbus, Ohio Adams 5432	Cambridge, Mass. Kirkland 5330
Alexandria, Va. Alexandria 3581	Washington, D. C. Shepherd 5249	Baltimore, Md. Glenburnie 790-J	Durham, N. C. Durham X-5544
Rutherford, N. J. Rutherford 2-7434	New Castle, Pa. New Castle 2285	Pittsburgh, Pa. Atlantic 9798	Omaha, Nebr. Atlantic 8305

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The Peatrophone

"Amazing." "Most interesting." "A new source of income." "It will fit our situation" . . . these are a few of the comments telephone companies have made after learning about Peatrophone. "The Mechanical Secretary." We will be glad to advise you about our leasing plan which makes Peatrophone service obtainable by your subscribers for a small monthly rental without investment by you.

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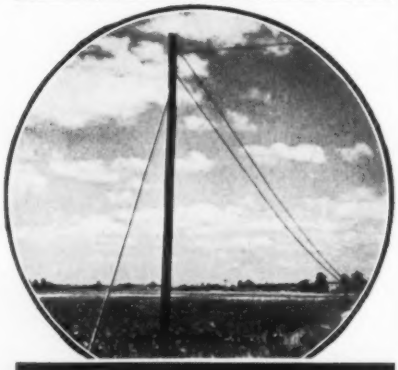

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TELEPHONE WIRE
STEEL STRAND

● *Crapo* Galvanized Line Wire and *Crapo* Galvanized Steel Strand combine strength, ruggedness and durability with low first cost, low maintenance expense. *Crapo* HTL-85 and *Crapo* HTL-135 High-Tensile, Low-Resistance Line Wires have made possible new, long-span construction. *Crapo* Galvanized Steel Strand for years has been first choice of many leading utilities for guying and messenger purposes. Ask the jobber of *Crapo* Galvanized Products near you or write—

INDIANA STEEL & WIRE CO.
MUNCIE, : : INDIANA

Takes Refuge on Top of Booth in Missouri Flood

Miss W. S. Liles, night operator of the Silex Telephone Co., Silex, Mo., was forced to seek refuge on top of the central office telephone booth during the recent flood; there she waited 11 hours until the waters had receded. Maintaining the tradition of fellow operators in similar emergencies, she stuck to her post at the switchboard as long as it was possible for her to be of service.

Preparations for repairing the damage to the Silex exchange began October 11. The exchange office—along with other business houses in Silex—was flooded to a depth of approximately four feet.

Shortly after the flood the Silex exchange was sold by Dr. and Mrs. W. H. Eberle to J. R. Carter of Perry, Mo. Mr. Carter, who operates exchanges in four other towns of Missouri, has been in the telephone business for 14 years. Mr. Carter intends to render the same high type of service as given by the former owners and to improve the system in anyway possible.

Company Organized to Make Receiver-Holding Device

Hold-the-Phone, Inc., Dayton, Ohio, was authorized to be incorporated at Columbus November 25, by the secretary of state. The firm will manufacture a device to hold the receiver of a telephone so that the user will have both hands free.

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Personnel Changes in Signal Corps

Col. S. W. Stanley, has relinquished his post as executive officer to Maj. Gen. Dawson Olmstead, Chief Signal Officer of the U. S. Signal Corps., to devote his full attention to the growing and important functions of the Administrative Branch of the Office of the Chief Signal Officer of which he is head. He was succeeded as executive officer to General Olmstead by Lt. Col. James A. Code.

Colonel Code has achieved notable results as head of the Executive Control Division, the coordinating and liaison agency of the Signal Corps to keep all its branches under constant check and study.

Maj. S. R. Irwin has been designated to succeed Colonel Code as head of the Executive Control Division. Lt. Col. Thomas C. Rieves succeeds Col. Hugh Mitchell as head of the Research and Development Division in the Material Branch.

Early in November a new important division was started, the Air Communications Division, headed by Lt. Col. F. C. Mead, which will supervise operations and will handle the Aircraft Warning Service Signal Corps troops on duty with the Army Air Corps.

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I. T. & T. Reports Telephone Gains; Supply Latin America

Telephone operating subsidiaries of the International Telephone & Telegraph Corp. in nine countries report a net gain of 45,019 telephones in service during ten months of 1941.

Several of the companies in Latin America continue to report some difficulty, because of the manufacturing and shipping dislocations due to the war, in meeting the increased demand for telephone service. This situation is expected to be relieved by the new factory in Newark of I. T. & T.'s manufacturing subsidiary, International Telephone & Radio Manufacturing Corp. The factory is in production and is supplying telephone equipment for Latin America as rapidly as materials can be made available.

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Dividend Declared

A regular semi-annual dividend of 20 cents per share and a special extra dividend of 10 cents per share, a total of 30 cents, payable on or before the 5th day of December to stockholders of record as of the 28th day of November, has been declared by the board of directors of United Utilities, Inc., Abilene, Kans.

XUM

Commissions and Courts

Governmental Body Spends Less Than Appropriation

Almost unheard of in these days of mounting governmental extravagance is a subdivision that spent less than the money appropriated for its use and returned the money to the treasury from which it was appropriated.

The Illinois Commerce Commission, according to this unusual news item made public in the news letter service of the Illinois Telephone Association, has returned $108,042 to the state treasury from the appropriations made by the 1939 Illinois General Assembly. This represents the unexpended balance at the end of the biennium, July 1, 1941. The present commission operated under the 1939 appropriation for the first six months of this year. Chairman John D. Biggs also pointed out that the appropriation for the present commission for the current biennium is $107,000 less than it was two years ago.

Rate Increase for Exchange At Weston, Ohio

The Northern Ohio Telephone Co. was authorized, in an order entered November 18 by the Ohio Public Utilities Commission, to increase monthly rates in its Weston exchange area, as follows:

Business, independent line, from $2.50 to $3.00; business two-party at $2.25 to be discontinued; business five-party, (new) $2.25; business rural, 20-party at $1.75 to be discontinued; business rural 10-party, (new) $2.25; residence, independent line, from $2.50 to $2.75; residence four-party to be discontinued; residence five-party, (new) $2.00; residence rural, 20-party to be discontinued; residence 10-party, (new) $1.75.

Rate Increase Approved For Burlington, Ind.

The Union Telephone Co., of Burlington, was authorized recently by the Indiana Public Service Commission to increase its rates from 50 to 75 cents a month. The new schedule of monthly rates follows: Single line business, $2.50; single line residence, $2.00; two-party residence, $1.85; combination residence and business $2.00; rural party line business, $2.25; rural party residence, $1.85; and extension, 60 cents.

Summary of Commission Hearings and Rulings

Federal Communications Commission

November 21: Southwestern Bell Telephone Co. granted special permission to publish and file revisions to its tariffs to provide for the discontinuance of Labette, Kans., as a rate center and to show that this point takes the same rates as Oswego.

November 25: Adopted order granting authority to Edward W. Meyer to hold the position of director of Two States Telephone Co. in addition to positions as secretary and treasurer of Southwestern Bell Telephone Co. and secretary of Southeast Missouri Telephone Co. and Ozark Central Telephone Co.

November 25: Adopted order granting authority to Peter L. Schauble to hold positions as vice president of Bell Telephone Co. of Pennsylvania and the Diamond State Telephone Co.

November 26: Application filed by Southern Bell Telephone & Telegraph Co. for permission to supplement existing facilities between Dothan, Ala., and Panama City, Fla.; between Johnston and Trenton, S. C., and between Trenton and Graniteville, S. C.

November 26: Application filed by Southwestern Bell Telephone Co. for permission to supplement existing facilities between Texarkana, Ark., and New Boston, Texas.

California Railroad Commission

November 22: Willow Creek Telephone (LaRue Smith, owner), granted authority to increase rates at Paso Robles.

November 23: Petition filed by the Los Gatos Telephone Co. for authority to make certain changes in its base rate area, and to withdraw or change certain other schedules of rates applicable to the Los Gatos exchange.

Georgia Public Service Commission

November 15: The commission ordered a survey of the Seminole Telephone System in Donalsonville following complaints of poor service and inadequate equipment at a hearing held recently in Atlanta.

Illinois Commerce Commission

October 27: The commission suspended until February 27, 1942, the Illinois Valley Telephone Co.'s proposal to raise rates in Roseville and Vermont.

October 27: The commission suspended until March 8, 1942, the Illinois Central Telephone Co.'s proposal for increased rates in Henry.

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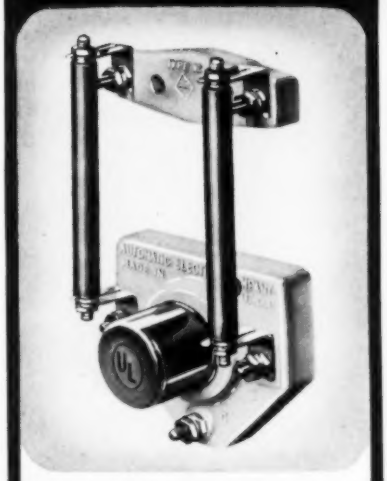

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November 12: The commission authorized the Illinois Central Telephone Co. of Clinton to issue a note for $1,350,000 to the Illinois Communities Telephone Co. with headquarters in Wilmington, Del., its parent organization, to repay part of earlier advances.

December 2: Hearing at Springfield in the matter of proposed rates of Illinois Commercial Telephone Co. for service in Shawneetown.

December 3: Hearing at Springfield in the matter of proposed advance in rates for Brownstown (Sefton Lines) filed by Fayette County Mutual Telephone Co.

December 3: Hearing at Springfield in the matter of proposed advance in rates for Stanford, Tremont, Mackinaw, Groveland and Minier stated in rate schedules filed by Illinois Valley Telephone Co.

December 4: Hearing at Springfield in the matter of proposed advance in rates for service in Forreston and German Valley stated in rate schedule of Forreston Mutual Telephone Co.

December 4: Hearing at Springfield in the matter of application of Milford Telephone Exchange Co. for authority to file changes in its schedule of rates applicable to its Milford exchange, on less than 30 days' notice.

Kansas Corporation Commission

December 1: Hearing on application of Washington Mutual Telephone Co. for authority to make certain changes in rates at Washington.

December 1: Hearing in re application of Central West Utility Co. for a certificate relating to a proposed issue of its 3½ per cent refunding bonds in the amount of $275,000.

December 1: Hearing in re application of Nemaha-Marshall Electric Cooperative Association for a certificate of convenience and authority to transact the business of a public utility in Marshall county.

December 2: Hearing in re application of North Central Kansas Rural Electric Cooperative Association for a certificate of convenience and authority to transact the business of a public utility in Republic county.

December 12: Hearing in re application of Southwestern Bell Telephone Co. for permission to file and put into effect standard toll rates between Emporia and Saffordville.

December 15: Hearing on complaint against Rock Island Telephone Line by Riley Rural Telephone Co., as to denial of service.

Missouri Public Service Commission

November 22: Application filed by Oregon Farmers Mutual Telephone Co. for authority to file schedule of rates for service at Oregon.

November 25: Application filed by The United Telephone Co. for orders fixing the value of its property used and useful in furnishing telephone service at California, King City and Platte City.

November 27: Hearing on complaint of Fidelity Telephone Co. vs. Rosebud Telephone Co. as to refusal of service through the Rosebud exchange to certain subscribers.

Nebraska State Railway Commission

December 15: Hearing date set for consideration of application of the Lincoln Telephone & Telegraph Co. for readjustment of rates at 84 of its 117 exchanges, involving a request for $212,000 additional yearly revenues and an increase in depreciation rate from 3.50 per cent to 4.25 per cent.

COMING CONVENTIONS

Kentucky Independent Telephone Association, Brown Hotel, Louisville, December 12 and 13.

Minnesota Telephone Association, Radisson Hotel, Minneapolis, January 27, 28 and 29, 1942.

Texas Telephone Association, Hotel Adolphus, Dallas, March 18, 19 and 20, 1942.

Pennsylvania Independent Telephone Association, Sterling Hotel, Wilkes-Barre, May 21, 22 and 23, 1942.

Missouri Telephone Association, Muehleback Hotel, Kansas City, November 16, 17 and 18, 1942.

New York Public Service Commission

December 4: Hearing at New York on proceeding on motion of the commission as to rules, regulations, practices and facilities of New York Telephone Co., Rochester Telephone Corp. and Upstate Telephone Corp. of New York.

North Carolina Utilities Commission

October 19: Order directing the Central Electric & Telephone Co. to improve service in Jefferson and West Jefferson. The company is directed to improve central office equipment and to report on the possibility of converting the present magneto exchange to an automatic type; to improve service between West Jefferson and North Wilkesboro by adding a circuit; to survey the need for rural telephone service to Warrenville and Lashing; to report on the possibility of building a line from West Jefferson to Boone in cooperation with the Southern Bell Telephone & Telegraph Co.

The number of telephones operated by the Central Electric company in Jefferson and West Jefferson and contiguous territory totals 164.

Ohio Public Utilities Commission

November 24: Cincinnati & Suburban Bell Telephone Co. authorized to revise its schedules for Reily and Shandon exchanges to show that the service area includes certain territory in Indiana where it has some 26 subscribers, the Cincinnati exchange to show that service area includes Kentucky metropolitan exchange to extended service in Erlanger exchange of the Citizens Telephone Co. of Kentucky and the Terrace and Hamilton county suburban exchange to show that subscribers for the extended service have the same as Cincinnati.

November 24: Ohio Bell Telephone Co. authorized to correct by new filings its schedules to show service area outside state of Ohio as follows: Aberdeen exchange to show that Mays Kick, Ky.,

XUM

exchange included in the service area is an exchange of the Mason County Telephone Co. instead of the Southern Bell Telephone & Telegraph Co. and that the Fernleaf and Washington exchanges of the Mason County company are included in local service area of Aberdeen, Sharon and Sharpsville exchange of the Chesapeake & Potomac Telephone Co. of West Virginia as exchange in local service area.

November 26: Cincinnati & Suburban Bell Telephone Co. authorized to issue a sufficient number of shares of $50 par value common stock (at not less than par) to realize the sum of $4,900,000, the proceeds to be used to reimburse the treasury on account of $4,910,633.17 uncapitalized capital expenditures expended as of December 31, 1938.

November 26: Ohio Bell Telephone Co. authorized to amend its toll rate and route guide to show that subscribers of the Rudolph exchange of the Oil Belt Telephone Co. will hereafter be furnished toll service through the Portage exchange of that company.

December 2: Hearing on joint application of Troy Telephone Inc. to purchase and capitalize the properties of the Troy Telephone Co. and the T. P. P. Telephone Co.

Oklahoma Corporation Commission

December 4: Hearing on application of about 25 residents of suburban area east of Oklahoma City for service through Oklahoma City exchange of Southwestern Bell Telephone Co. J. B. Bohlen, Nicoma Park, manager, Nicoma Park and Choctaw Telephone Co., appeared as intervener. Some of the applicants reside within territory served by Mr. Bohlen.

Wisconsin Public Service Commission

November 15: Extension of service ordered from Milwaukee exchange area of Wisconsin Telephone Co. to certain subscribers in the Calhoun Farms subdivision. Service from the Waukesha exchange must be maintained to others in the area, the commission ruled.

Request to serve the entire area and nearby subscribers exclusively from the Milwaukee exchange, denied.

The commission ordered the company to extend service in Emmet township, Dodge county; Turtle township, Rock county, and Saukville township, Ozaukee county.

December 2: Hearing at Grantsburg on application of Farmers Independent Telephone Co. for authority to increase rural rates at its Grantsburg exchange.

December 19: Hearing in investigation of complaint filed by Herbert Jacobs and 40 other residents of Westmorland and Sunset village against the Wisconsin Telephone Co. The complainants ask that the Madison base rate area be extended to include the two suburbs, both of which lie in the town of Madison.

Answers to Traffic Questions on Page 26

1. The call is referred to the supervisor. If the calling party refuses to pay for the call after the supervisor has explained that the third station will not accept the charge and that it will be necessary to bill the call to the calling station, the supervisor is instructed to refer the call to the employe locally designated to handle such cases and will proceed thereafter as directed by this employe.

   If the calling station is a public station and the supervisor is unable to secure the acceptance of the charge at the third station, she will handle the case as a shortage, entering "shortage (amount)" in green diagonally across the face of the ticket, the reason why the charge was not collected, signing her personal number and referring the ticket to her chief operator.

2. If a supervisor at an OTC passes the details for an IN ticket to a supervisor at a TTC and explains that she wishes to reverse the message charge on a call to a coin station at your office, the supervisor at the TTC will record the ticket in the usual way; for example, she will enter "sr 2 (OTC)" in the "Special Instruction" space. The TTC supervisor says, "This is supervisor (her no.)" and enters the "received time" in the space for reports and her personal number in the "Operator" space.

   If the charge is accepted, the supervisor requests the deposit of the charge, supervises its collection, enters "yes" in the "Accepted" space, reports "OK collect" to the OTC supervisor, and releases the circuit as soon as acknowledgment is received. The TTC supervisor enters the number of minutes and the message charge in the proper spaces on the ticket and writes "timed at (OTC)" on the back of the ticket and "made col after conv" in green across the face of the ticket and files it.

3. There is no necessity for this action, however; if the operator at the terminating office has been instructed to handle calls in this manner, she must abide by the instructions of her company.
4. Yes.
5. The answer to this question is contained in the preface.

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In the Nation's Capital

(Concluded from page 13)

the continuance of a war in which the U. S. is engaged.'"

"These emergency powers are not believed, in some government quarters, to be adequate during these days of undeclared war. An attempt to increase the government's authority may be made during consideration by Congress of the Sanders bill to split the FCC into two sections—one for regulation of radio and one for the communications carriers. Hearings on the Sanders bill are scheduled to begin before the House Interstate and Foreign Commerce Committee late in January."

There is no hint of just what form the suggested amendatory legislation might take; or, for that matter, whether it will contain anything at all affecting the telephone and telegraph industries. Most of the gossip seems to center around the radio end.

But whether or not there is any fire behind this smoke, the mere suggestion emphasizes once more the advisability of telephone and telegraph carriers getting as far away from the troubled field of radio regulation as they can. (That might well be true not only of regulation under the FCC but priorities, price control and other matters.)

The radio broadcasting men themselves have expressed no particular fondness for their regulatory association with the "common carriers." They have from time to time expressed fear that the so-called "common carrier concept" might spill over from the telephone end of the FCC into the radio end of the FCC to the detriment of the latter. Why not make it about unanimous?

This might explain why some telephone men are beginning to think well of the Sanders bill—aside from threatening committee amendments in the form of broadening the emergency powers of Section 606. There is an old Arabian proverb to the effect that the wise traveler, no matter how weary, will see that he does not pitch his tent next to an ant hill.

▼ ▼

New Submarine Cable In the Red River, Texas

The American Telephone & Telegraph Co. is installing a submarine cable in the Red River, seven miles east of Denison, Texas. It replaces a link lost to floodwaters last June. The cable, contained on five large spools, weighs a quarter of a million pounds.

The company is bringing a large boat to Denison to be used by splicing crews as the five sections are made into one. After the cross-country long-distance wires were lost last summer, an aerial section was used across the river. More than 300 pairs of wires are in the aerial section and will go into the underwater cable.

▼ ▼

A. W. Page Slated as Director Of Canadian Bell

Because of the pressure of business duties in the United States, Walter S. Gifford, president of the American Telephone & Telegraph Co., plans to resign from the board of directors of the Bell Telephone Co. of Canada, it was announced late last month. He will be succeeded by Arthur W. Page, vice president in charge of public relations of A. T. & T.

The parent company owns 22.8 per cent of the common stock of the Canadian Bell company, it was stated.

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Problems in Hawaiian Islands

(Continued from page 19)

Naturally Mutual officials did everything possible to comply with such requests for cooperation.

The charts in the plans division of the company began to show that the time would come when applications for service might have to be refused in certain instances. This made it apparent the growth rate would have to be slowed. Accordingly, the company appealed late in July to the public utilities commission for permission to increase installation charges. The commission made a careful study of the application and not only endorsed it but suggested that the original application be withdrawn and a new one substituted containing an even higher schedule of installation and service connection charges.

This suggestion was complied with and the commission ordered it put into effect as of October 1, 1941. To this there was a gratifying minimum of adverse public reaction. One newspaper sputtered editorially, but when the facts were explained fully and frankly to the editor by Mutual's president, Alvah A. Scott, he changed his tone and printed another editorial supporting the move. Another newspaper used a misleading headline that gave the impression rates were to be increased. This caused a small flurry but was quickly rectified.

All in all, the reaction was so slight as to be practically negligible, partly because of a publicity and advertising campaign that explained honestly that the increases were for the protection of present subscribers. *Late in November, nearly two months after the increased charges went into effect, it was clearly apparent that the installation rate had declined considerably, although it was still not too far below the danger level.*

The sharp gains in the calling rate presented an entirely different kind of problem. Some people can be discouraged from having telephones installed but few can be persuaded to use them sparingly, even to conserve facilities for the benefit of national defense.

The general advertising and publicity campaign of the company had the public fairly well informed as to the difficulties, and their causes, under which the company was operating. Some effort was expended toward suggesting brief conversations and avoiding the peak periods for purely routine calls "when it is convenient." Such efforts may have had slight effect, but not much. The main benefit was in making subscribers understand the abnormal conditions and in asking for patience if and when it is needed.

Fortunately, two fairly large shipments of selectors, line-finders and switching apparatus were received as the congestion was becoming critical and their installation at points where they were most urgently needed enabled the system to carry the traffic. However, as the tempo of the defense program has increased rather than abated, the calling rate has continued to rise and the race between it and these installations is continuing neck and neck.

Still another factor that was added to the problems is the fact that the new and enlarged army and navy posts are all located in rural areas and are scattered over different parts of the island. Of course, these posts have their own systems extending as far as their gates, but as each post mushrooms into being, the surrounding area becomes populated more densely. This has necessitated swift expansion of cable facilities in all directions. In one case a 30-pair cable had to be replaced by one of 200-pair capacity across a corner of the island with the most difficult terrain imaginable. Several other 200-pair cables have been laid between outlying centers or to areas containing new posts.

Several housing projects containing 2,088 dwelling units rose quickly just outside the gates of Pearl Harbor. For their telephone service the navy was to defray a large portion of the plant costs and secured a high preference rating. In spite of this, deliveries could not be made in less than from four to six months and families were moving in rapidly. The Mutual company volunteered temporary party-line service so those families would not be entirely without telephones; another case in which reserve equipment was absorbed for defense use.

Party-line service was just getting started in Honolulu when the defense program got under way and is proving exceedingly helpful. In several areas containing mostly apartment buildings or small dwellings crowded closely together, it has been necessary to restrict service to party-line stations in order to conserve facili-

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"Telephony's" Engineering Data

By J. Ernest Hartz

Index, Open wire Construction.
December 6, 1941.
No. 8-B, page 13.

Materials and Supplies for Open Wire Construction (Concluded)

Wire: (Continued from November 29)

109 galvanized steel or BB wire (No. 12 B.W.G.): Weight, 170 lbs. per mile. ½-mile coils.

134 galvanized steel or BB wire (No. 10 B.W.G.): Weight, 258 lbs. per mile. ½-mile coils.

165 galvanized steel or BB wire (No. 8 B.W.G.): Weight, 378 lbs. per mile. ½-mile coils.

203 galvanized steel or BB wire (No. 6 B.W.G.): Weight, 590 lbs. per mile. ⅓-mile coils.

Single solid rubber covered wire (.081 in. dia.—No. 12 B. & S.): Used for battery feed ground wire and for ground wire for four or five protectors; 22.7 feet per pound.

Single solid rubber covered wire (.162 in. dia.—No. 6 B. & S.): Used for ground wire for terminal protection 6.8 feet per lb.

Ground wire: To connect substation protectors to ground connections. This rubber-covered, single-conductor wire is weatherproofed with an asphalt saturant and coated with stearine pitch and paraf-

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"Telephony's" Engineering Data

By J. Ernest Hartz

Index, Open wire Construction.
December 6, 1941.
No. 8-B, page 14.

fin. It is available in two colors (brown or ivory) in 1,000-foot coils each containing five connected, separately bound, 200-foot coils.

Soft drawn copper tie wire: For regular and single pin transposition ties with hard drawn copper wire. This wire is available in bundles of approximately 50 lbs.

17 in.	080	(No. 14 N.B.S.)	36 ties per lb.
19 in.	080	(No. 14 N.B.S.)	31 ties per lb.
19 in.	104	(No. 12 N.B.S.)	19 ties per lb.
21 in.	104	(No. 12 N.B.S.)	18 ties per lb.
22 in.	128	(No. 10 N.B.S.)	11 ties per lb.
24 in.	128	(No. 10 N.B.S.)	10 ties per lb.
24 in.	165	(No. 8 B.W.G.)	6 ties per lb.

Drop wire ties: No. 18 St. W.G. (.047 in. dia.) soft annealed galvanized steel wire is covered with a triple waterproof cotton braid, without rubber insulation. The ties are 36 ins. long; 21 ties weighing a pound. They are available in 10-lb. bundles.

Galvanized tie wire: For standard and transposition glass ties with steel and BB wire. This tie wire is available in bundles of approximately 10 lbs. each.

12 in.	083	(No. 14 B.W.G.)	53 ties per lb.
14 in.	083	(No. 14 B.W.G.)	39 ties per lb.
12 in.	109	(No. 12 B.W.G.)	31 ties per lb.
14 in.	109	(No. 12 B.W.G.)	21 ties per lb.
12 in.	134	(No. 10 B.W.G.)	20 ties per lb.
14 in.	134	(No. 10 B.W.G.)	14 ties per lb.

Tool:

Sleeve rolling tool: This is a gear-driven device provided with a set of rolls, equipped with three sizes of sleeve grooves. The smallest groove accommodates the sleeves for 080 copper, 104 copper, 083 and 109 steel wire. The 128 S copper, 109-H and 134 S steel sleeves are rolled in the middle groove and the 165 S copper sleeve in the largest groove of the rolls. Any compression tool to accomplish the same purpose is acceptable. However, care should be exercised to be sure that sleeves usable with the particular kind of splicing tool are procured.

"Telephony's" Engineering Data

By J. Ernest Hartz

Index, Open wire Construction.
December 6, 1941.
No. 8-B, page 15.

Wire Diameters by Different Wire Gauges

Diameters in Mils (1 Mil — 0.001 Inch)

Gauge No.	*AWG or B&S*	*B.W.G.*	*N.B.S.*
0000	460	454	400
000	410	425	372
00	365	380	348
0	325	340	324
1	289	300	300
2	258	284	276
3	229	259	252
4	204	238	232
5	182	220	212
6	162	203	192
7	144	180	176
8	128	165	160
9	114	148	144
10	102	134	128
11	91	120	116
12	81	109	104
13	72	95	92
14	64	83	80
15	57	72	72
16	51	65	64
17	45	58	56
18	40	49	48
19	36	42	40
20	32	35	36
21	28.5	32	32
22	25.3	28	28
23	22.6	25	24
24	20.1	22	22
25	17.9	20	20
26	15.9	18	18
27	14.2	16	16.4
28	12.6	14	14.8
29	11.3	13	13.6
30	10.0	12	12.4

AWG—American Wire Gauge.
B&S—Brown and Sharpe Gauge.
BWG—Birmingham Wire Gauge.
NBS—New British Standard.

XUM

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ties. General acceptance of this type of service has been exceptionally good.

Telephone executives in Honolulu, as elsewhere, are wondering what will happen when the defense program is completed and conditions begin to revert to normal. Many families will go back to their former levels of earnings and will not longer want telephones, business houses will not need the larger switchboards they are using to capacity these days, and the increased exchange and trunking facilities will have to wait until normal growth catches up.

More than that, much of the expansion in cable plant has been into areas where development may cease altogether, and since cable plant is better than 45 per cent of investment, idle cable facilities have to be reckoned seriously.

Other systems throughout the United States are, of course, having experiences similar to those of the Mutual Telephone Co., but it is doubtful if any are having such concentration of problems. And in addition to service for the community, there is the responsibility of maintaining communications between the numerous army and navy posts, not only under the present rushed conditions during the period of preparedness, but also in event these establishments should ever be engaged in actual combat. The defense program has meant, and does mean, a great deal to Mutual of Hawaii.

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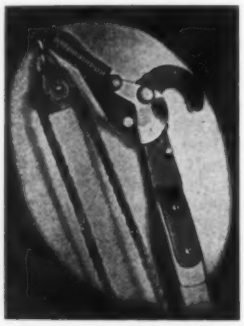

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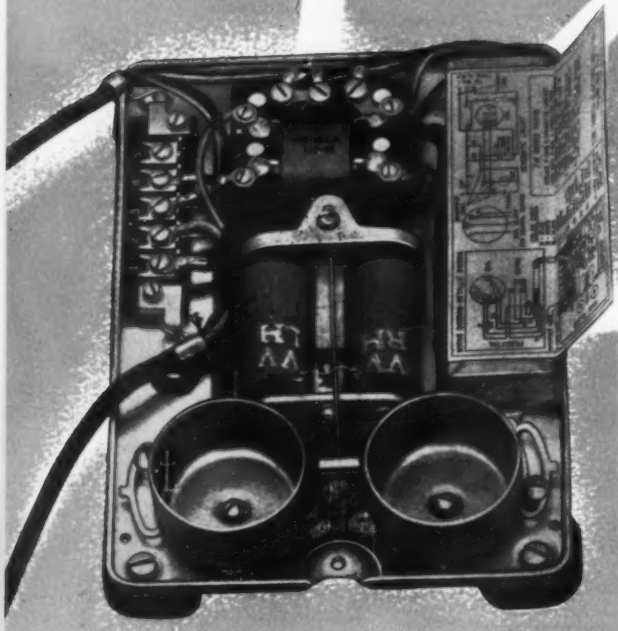
Where the NORTH base must perform its duty as a separate ringer box, this cover (upper right) protects the dependable mechanism of the NORTH interchangeable base.



By giving distinction to the wall telephone set (right) NORTH has lifted it out of the commonplace. With the NORTH interchangeable base it becomes an independent unit.

The NORTH interchangeable base (left) is a combination of foresight and advanced engineering skill. By building into it a number of new and exclusive features—maximum operating efficiency—NORTH enables the exchange operator to anticipate his ever increasing subscriber demands and thus keep them happy. The NORTH interchangeable base is the first step to progressive telephone service. Why not take this step today while there are ample stocks on hand? Additional detailed information will be sent upon request.

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